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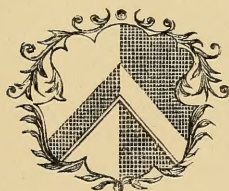
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January 1899.

SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

A CASE OF ABDOMINAL CYST, FROM WHICH, AFTER TAPPING, ALL FOOD TAKEN BY THE MOUTH AND ALL BILE SECRETED ESCAPED.—CURED BY PRESSURE.

BY

SIR THOMAS SMITH, BART., F.R.C.S. ENG.

T. C., æt. 50, a gardener, a thick-set healthy man, was carrying a ladder on his shoulder which overbalanced him backwards. To recover himself, he made a violent muscular effort, and was seized with severe pain in the abdomen. He continued his work for a time, but next day was attacked with vomiting and violent coughing, after which he noticed a considerable swelling in the upper part of his belly. He became seriously ill, and for a week suffered with symptoms of intestinal obstruction.

Three weeks or later the veins of both lower limbs became thrombosed, and on recovering from this he had an attack of pneumonia.

Six months or more after the date of the accident, he came into the Hospital under my care on October 1, 1897.

On admission, a tumour was found in the upper part of the abdomen, reaching from the ensiform cartilage to an inch below the umbilicus, the bulk of it being to the left of the mesial line; it was rounded, elastic, tense, fluctuating, dull to percussion; there was transmitted pulsation; the stomach and intestines were displaced; the lower part of the abdomen was resonant; the tumour moved with respiration; the heart sounds were normal, and the urine free from albumen and sugar.

From the nature of the accident (a violent posterior flexion of the spine) and the subsequent history, it was assumed that the tumour was probably caused by the rupture of some vessel into the lesser cavity of the peritoneum, and in this diagnosis Dr. Church, who was good enough to see the patient for me, concurred.

As the swelling was increasing in size, on October the 21st the abdomen was opened over the most prominent part of the tumour, midway between the ensiform cartilage and the umbilicus. The great omentum being torn through, an exploratory puncture was made with a fine trocar, and subsequently eight pints of dark brown fluid were drawn off through a larger trocar; the cyst was sutured to the parietal peritoneum and the deep layer of the abdominal wall; a tube was fastened in the cyst and connected with a rubber tube draining into a glass jar beneath the patient's bed. The abdomen was bandaged pretty firmly.

The fluid contained neither bile nor digestive fluid; the sp. gr. was 1009; it was alkaline; no food debris found, but methæmoglobin.

October 22.—The patient was much relieved; eight ounces of fluid had drained away in the night; towards the evening there was a suspicion that the milk taken by the mouth was escaping through the tube, and before morning it was certain that fluid taken by the mouth quickly appeared in the jar beneath the bed; the fluid contained fat globules, food debris, and bile.

October 23.—An experiment was made with a coloured solution, and it was found that within three minutes from the time of swallowing the fluid appeared in the jar; 56 ounces escaped. From observations taken it was ascertained that everything taken by the mouth passed out at the tube. Systematic feeding by the bowel was commenced and continued; no food by the mouth.

October 24.—Bile began to escape in large quantities; as much as 30 ounces passed this day, and the patient began to lose ground.

October 25.—Forty ounces escaped; 26th, 34 ounces; 27th, 42 ounces; 28th, 45 ounces. Meantime the patient was rapidly emaciating and losing strength, so that his condition seemed desperate. He had lost 260 or more ounces of bile, food could not be retained when swallowed, and the rectal feeding did not maintain his strength.

The question of operation was discussed, but the exhaustion of the patient was such that no operative measure seemed

possible, and those of my colleagues who saw him with me considered, as I did, that his case was hopeless. During the week that followed the operation, from time to time small quantities of nourishment were given by the mouth, but none was retained, and certainly it was not digested. The tube was shortened, it was reduced in size, but nothing seemed to arrest the flow of bile or prevent the escape of food from the stomach. It was certain that in the operation the stomach had not been wounded, and the only difference that the emptying of the cyst could have exercised on the abdominal contents was to have greatly diminished the intra-abdominal pressure. With a view to restore the parts to their condition before the operation in this respect, I retained the tube and bandaged the abdomen as tightly as my strength would allow, leaving the end of the tube free from pressure (and one would have thought I could not have adopted a more futile measure); but from that moment bile ceased to flow, food could be retained, and the patient rapidly recovered. The pressure was constantly maintained, and only relaxed when it was necessary to re-apply the bandage; he left the Hospital wearing a tight-fitting abdominal belt, with no sign of abdominal tumour; nine months later he was in robust health, but was advised to continue to wear his belt.

REMARKS.

There can be little doubt that the case was one of peritoneal hæmatoma, the effusion taking place at the back and upper part of the abdomen, in front of the spine, and probably beneath the parietal peritoneum. The latter contributed to form the cyst wall, which pushed forward into the lesser cavity of the peritoneum and pretty completely filled it. The bulk of the cyst at the operation was found to be behind the stomach and the anterior layers of the great omentum lay in front of it.

The cyst, at the first tapping, evidently contained disintegrated blood without trace of bile, pancreatic fluid, or stomach contents; but within twenty-four hours from the operation there was evidence that food was escaping from the tube, and before forty-eight hours had elapsed both food and bile were flowing freely—so freely that practically neither the one nor the other passed into the intestines.

There was, therefore, demonstrative evidence that a free communication existed between the intestine, and probably the duodenum, and the cyst cavity; this would account for the

escape of the bile and the very short interval between the swallowing of food and its exit through the tube.¹

A great difficulty occurs in deciding when the communication first took place, and whether it was the result of a rupture or from ulceration. It was certain that the bowel was not injured at the operation, and very unlikely that it was ruptured at the time of the accident; nor can one understand why its existence became manifest within twenty-four hours of the operation. The fact of importance remains incontrovertible, namely, that a free communication between the bowel and cyst cavity existed, and that it was obliterated or cured in some way by firm pressure on the abdominal contents, and that thereby the patient's life was saved.

It is possible, in view of the result of this treatment, that there are other lesions of the abdominal contents where it would be worth while to adopt the same measures, namely, in cases in which perforations from gastric, duodenal, or typhoid ulcers, or wounds of the intestines are suspected, but where the symptoms are not sufficiently clear to justify surgical interference. The ready answer to this suggestion would be, What good could pressure do in these cases? I would venture to suggest that firm pressure might limit the escape of intestinal contents to a comparatively small area and favour a local adhesive peritonitis. At all events, the fact remains that in the case related the compression of the abdominal contents did at once and (one may say) for ever arrest the escape of bile and food from an opening in the intestine.

¹ As the result of experiments, it is found that fluids taken by the mouth on an empty stomach pass at once into the duodenum.

SECONDARY CATARACT.

BY

HENRY POWER, F.R.C.S. ENG.

The term secondary cataract has been applied in two senses—in the first place, to an opaque condition of the lens which occurs as a sequela to some other affection, as, for example, when it appears in the last stages of glaucoma, and of severe iridocyclitis, in cases of intraocular tumour, of retinal detachment, and of dislocation of the lens; and, secondly, to opacities which follow operations for the removal of lenticular cataract. In the former case the opacity implicates the whole lens, in the latter it is formed by the remains of the lens enclosed in the ruptured capsule with some new growth derived from the proliferation of the cells lining the capsule, often supplemented with inflammatory products proceeding from the iris and adjoining parts. It is to these forms, termed “Nachstaar,” or after-cataract, by the Germans, that the following remarks apply.

That considerable differences in the results of operations on secondary cataracts occur in the hands of different surgeons, we may gather from a remark made by M. Dufour of Lausanne¹ in an article on this subject, in which he says that M. Gayet dreads no operation more, and is of opinion that such operations are always uncertain, often useless, and sometimes very dangerous. On the other hand, Professor Knapp of New York operated on 74 per cent. of his cases, as a general rule, and obtained in most of them considerable improvement in the sharpness of vision without having to deplore the loss of a single eye. It is obvious that the experience of these two distinguished operators must have been in marked contrast, and we can only conclude that such contrast was due to the mode of operating on the primary cataract practised by each of them, or to the method in which the secondary cataract was attacked.

¹ Archives d'Ophthalmologie, 1890.

There are few ophthalmic surgeons who have not had occasion to regret that they have been persuaded by patients, who were already able to see well for all practical purposes, to undertake the operative treatment of secondary cataract, or, which is a still more unfortunate circumstance, that with the desire of perfecting their handiwork, and of enabling the patient to read and work, they have themselves suggested a further operation. In such cases, the anticipation of the coming primary operation may have extended over years, and at length, comprehending his inability to recognise the features of familiar friends, to see steps, or the nature of the food on his plate, and reminded in various other trifling or more serious ways of the great deterioration of his vision, the patient determines to submit to the operation of extraction. It is done, the surgeon assures him, successfully, the prospects are excellent; and when the first dressings are changed, if he be allowed to open the eye, he can not only see the light, but the movements of his own hands or the bars of the window, and a day or two after may be able to count the fingers at the distance of a foot or two, and thus all seems to promise a prosperous issue. In some few instances, indeed, that hope is realised. The inflammatory reaction after the operation is slight, and as days pass by vision steadily improves; glasses are prescribed for the patient, and within a month type of moderate size can be read with glasses of appropriate strength. On other occasions the course of events is not quite so satisfactory. The vision, which was passable when the bandages were first removed, becomes progressively more and more cloudy, and after the lapse of ten days or a fortnight, the patient, if not the surgeon, is dispirited at finding that objects are not more clearly seen than they were before the eye was touched. With time and patience, however, many of these cases also do well, the remains of the lens substance undergo absorption, and week by week the vision improves, till at length large type can be deciphered with tolerable facility. The same result may be obtained even when much hæmorrhage occurs at the time of operation, an accident that was not infrequent when Graefe's "modified linear operation," in which the section was large and made through the sclerotic, was first introduced. I remember assisting Mr. White Cooper many years ago in an operation of this kind, in which the anterior chamber, immediately after the section of the cornea, filled with blood, completely obscuring the pupil. The capsule had to be divided at a venture, but owing to the eye being otherwise healthy and absorption rapid, the blood quickly disappeared, and the patient had

very good vision without the necessity for the operation of needling.

But none of these cases, I venture to say, represent the usual course of events. In most instances, after the removal of the lens, and at the time of the operation, the pupil is seen to be cloudy, and different expedients are resorted to to render it clear. The cloudiness is chiefly due to cortical lens substance which has been left behind. This is, of course, much more likely to occur after the extraction of immature or soft cataracts than of mature, hard, and senile cataracts, especially if the corneal wound have been small. It is, however, rare in any case in which the anterior capsule has been lacerated in the usual way with the cystitome that the lens escapes from the eye without leaving some fragments in the area of the pupil, or without some residue of the cortical layers remaining tucked up in the collapsed capsule, which, swelling by the imbibition of the aqueous, comes to occupy the pupillary aperture.

By cautious manipulation with a grooved curette, part, though rarely the whole, of the soft pulpy substance can be removed, especially if aided by a little gentle friction of the eye through the closed lids, which brings forward the peripheral portions of the lens. There is danger in the repeated introduction of the curette. However smooth the instrument may be, and however delicately it is manipulated, it interferes with the cleanness of the corneal section and the exact adaptation of the edges of the wound. The anterior chamber, it is well to remember, is usually abolished after the section of the cornea is completed, and the iris is in contact or in close proximity to its posterior surface; consequently, in the act of introducing the curette and attempting to clear the pupil, the iris is apt to be bruised or even torn, and its subsequent prolapse facilitated. Lastly, in the efforts to remove fragments of the lens with the curette, the membrane of the vitreous humour may be ruptured. Such a complication should, if possible, be avoided, since it is difficult to control the quantity of the vitreous humour that may escape, whilst portions of the lens substance may be pressed into it. On account of the slowness of absorption, such fragments remain long unaltered, and constitute a serious hindrance to clear vision. The injured vitreous also bulges forwards, and, if no iridectomy have been done, may very probably lead to prolapse of the iris; while, in some cases, hyalitis is set up. On all these grounds the frequent introduction of the curette is to be avoided.

Another mode of dealing with portions of lens, and bring-

ing them into the area of the pupil, is by gently stroking the cornea with a smooth, round-edged silver or gutta-percha curette. Attention should be paid in this case to the condition of the epithelium of the cornea, which, if cocaine solutions have been too freely applied, is shrivelled, rendered opalescent, and easily separable. The pressure, therefore, should not be great nor too frequently repeated.

There is still another method of clearing the pupil at the time of operation, of which I have had but little experience, viz., by irrigation, but the objections to the frequent introduction of the curette already mentioned here also hold, whilst there is the additional risk of introducing foreign germs and exciting suppuration by the very means adopted to secure a good result of the operation. After making trial of all these plans on different occasions, I am content to extract the lens, slowly and steadily, through a comparatively large wound in the cornea, embracing nearly one-half of its periphery, and, if there be no complication or difficulty, without iridectomy. Then to divide the anterior capsule freely with the cystitome, and steadily and with gentle pressure to extract the lens. As it escapes, some of the cortical substance is almost always displaced by the edges of the corneal wound; but if the delivery be slowly effected, the cohesion of the lens substance is sufficient to cause it to follow the main body of the lens as a kind of tail, which is left behind if the outer layers of the lens are soft, if the corneal wound is too small, or if the lens is made by pressure with the curette to escape too rapidly. Supposing the pupil to be fairly clear, I leave the eye alone, trusting to nature to absorb the slight remains of the cortical substance, which become more hazy in the course of a week, but subsequently undergo absorption. If much cortical substance remain, I endeavour to remove a portion of it by introducing the curette, and sweeping it once or twice through the anterior chamber. If there have been any hitch in the operation, I at once perform an iridectomy. I am convinced that even when no iridectomy is performed, a large wound in the cornea facilitates all the after-steps of the operation, and adds little, if at all, to the dangers of subsequent prolapse of the iris.

The treatment of capsular cataract is probably undertaken more frequently in private than in hospital practice, partly because the former class of cases is kept for a longer time under observation, and partly because such patients demand or require a higher standard of vision to enable them to read and work than the ordinary labourer or servant, who is contented with such vision as may enable him or her to perform

such ordinary outdoor or domestic work, as requires only a moderate degree of sight.

In regard to the nature of secondary cataract, Becker¹ gives one of the best accounts extant of secondary cataract, which it may perhaps be instructive to summarise. He divides the forms into simple secondary cataract, in which the adjoining tissues are not implicated, and complicated secondary cataract (*cataracta complicata vel accreta*), in which the cornea, iris, ciliary body, and vitreous humour participate to a greater or less extent. He describes the conditions he found in a simple case in a woman who died two days after the operation of extraction with iridectomy. The wound was closed, the anterior chamber re-established, and the capsule, with the remains of the lens, probably occupied the same position as in life. The border of the excised iris was, it seemed, adherent to the cicatrix of the wound; but no adhesion was visible between the iris and the capsule. The edges of the lacerated capsule were much folded, and united towards the centre with the posterior capsule by amorphous material. The periphery of the capsular pouch contained a considerable quantity of lens substance, which, owing to the central cleaving together of the capsule, was, it appeared, very completely shut off from contact with the aqueous humour. The fibres of the Zonula Zinnii, on longitudinal sections, were swollen and thickened. The canal of Petit, with its characteristic folds, was distended. The entire layer of epithelium on the whole anterior and posterior surfaces of the capsule, up to the insertion of the zonular fibres, was perfectly preserved. More centrally situated was a thick layer of thoroughly normal lens fibres, which in their course followed the inflections of the capsule. These fibres were apparently healthy, and were probably not affected with the cataractous opacity. The middle of the mass was composed of the detritus of the lens, broken up lens fibres, and Morgagnian spheroids without nuclei. No trace of cell-growth was observable.

In a second eye operated on by v. Graefe, and examined several years afterwards, Becker found that the Zonule of Zinn was considerably swollen; the equatorial part of the capsule was considerably thicker than natural. The intracapsular cells of the anterior capsule formed a complete and regularly arranged layer. In the part corresponding to Petit's space there were many layers, and these were continued for a distance of about 1 mm. on the posterior capsule. Beyond this point the cells became progressively larger, more columnar or vesicular, and contained a nucleus staining blue with hæma-

¹ Graefe and Sämisch's Handbuch der Ophthalmologie, Band v. 1877, p. 394.

toxylin. As these cells lay continually nearer the centre of the mass, they presented some resemblance to Maier's nuclear zone; nevertheless they differed from the normal lens fibres, presenting appearances when obliquely divided that are never found in the latter. The thickness of this layer of newly formed fibres towards the axis of the lens was 2 mm., and it then expanded as a thinner layer composed of a not inconsiderable quantity of cataract substance and broken-down lens fibres, with fat, myelin, cholesterin crystals, and chalk granules. In this mass lay spheroidal bodies which resembled very closely some of the inflated equatorial cells just described, differing from them, however, in the absence of any nuclear structures. These were the Morgagnian spheroids. Thus, in the cases Becker examined, the conditions he found to obtain were, a well-preserved, almost normal epithelium; near the equator new formed transparent substance composed of imperfectly developed lens substance, enclosed in which was a variable amount of the remains of the cataract.

A. Alt¹ states that where free division of the capsule of the lens has been made, the margins roll outward and backward. The epithelial cells of the capsule swell up, and often large bladder-like bodies are seen and cells that present vacuoles. The latter, however, never contain a nucleus, and he is inclined to think both are myelin formations. A new formation of rudimentary connective tissue cells was sometimes found with proliferation of the cells of the capsule, and in the former a deposition of lime salts was occasionally seen, leading in some instances to the formation of bone.

The practice recommended and adopted in the treatment of secondary cataract varies considerably. It should depend on an intelligent appreciation of the conditions that are present. The natural division of secondary cataracts is into those which are composed only of the posterior capsule with an attenuated layer of cortical substance, and in which there has been little or no inflammation consecutive upon the primary operation, and those in which, in addition to the posterior capsule, there are the products of inflammation covering it and forming a dense and opaque membrane, to which the iris is adherent by its edges and by more or less of its posterior surface. In the former case the introduction of one or two needles to effect laceration of the membrane is sufficient to secure a clear pupil, in the latter several courses are open to the surgeon.

If we turn to the practice of the older operators, we shall

¹ Compendium der normalen und pathologischen Histologie des Auges, 1880, p. 209.

find that Scarpa,¹ who adopted and preferred the operation of depression to that of extraction of cataract, regarded secondary membranous cataract as a consequence of the operation having been imperfectly executed. In the slighter forms he did not operate, recommending the operator to leave it to nature, in the hope that absorption would take place. In cases of dense opacity he attacked the membrane from behind, introducing a curved needle through the *posterior* chamber into the mass, and pressing the membranous flocculi through the pupil, one after another, into the anterior chamber of the aqueous humour, precipitating them into the bottom of this chamber between the concavity of the cornea and the iris, where, he says, in a few weeks they dissolve altogether. In still more serious forms, where the secondary cataract is formed by the whole of the anterior portion of the capsule, or by several portions of it adhering to the ciliary zone, the surgeon, he says, having turned the point of the curved needle toward the pupil, should perforate the membranous cataract from behind forward; or, if its borders leave any interval between them sufficient to admit the convexity of the instrument, he should pass the hook through this opening, then turning the point of it backwards, should conduct it horizontally between the iris and the membranous cataract, as near as possible to its attachment with the zona ciliaris, and pressing the point of the hook into it, and into each border of it in succession, sometimes rotating the instrument between the fingers as if to twist the portion of capsule round the point of it, he should lacerate it as much as possible in every part of its circumference so as to clear the whole ambit of the pupil, and having collected all the pellicles of flocculi together, should push them with the point of the needle through the pupil into the anterior chamber of the aqueous humour. In doing this, the greatest care should be taken by the operator not to touch the iris, for on this precaution principally depends the prevention of any consecutive symptoms of importance. Notwithstanding the length of the operation, it may be necessary for him to make various movements with the needle. If a portion of the membranous cataract should be found adhering to the posterior surface of the iris, which will be known by this circumstance, that in stretching the small opaque membrane with the needle the pupil changes its figure, and from being round becomes oval or irregular, he should proceed with even greater caution than in the preceding case, making repeated but small and

¹ Practical Observations on the Principal Diseases of the Eyes, translated by James Briggs, 1806.

gentle movements with the needle in every direction, in order to obtain the separation of it without endangering the laceration of the iris at its union with the ciliary ligament. The predilection of Scarpa for entering the curved needle through the sclerotic and attacking the capsule from behind is noticeable. It is probably due to his familiarity with the operation of depression, now rarely practised.

The employment of two needles, suggested and frequently practised by Sir W. Bowman, was undoubtedly a great step in advance. It greatly diminished the risk of dragging upon the iris, and separation of the periphery of that membrane from its attachment, and of hæmorrhage by rupture of the vessels; but that it has been found to be not always satisfactory is sufficiently proved by the persistent efforts that have been made to improve upon it, and there are undoubtedly some objections to this method.

Sir W. Bowman¹ considered that an operation for secondary cataract is not to be attempted if the patient can read Nos. 5 or 6 Jäger, and no operation should be undertaken until the eye is entirely free from any inflammatory or congestive tendency that may have followed upon the original operation. "For even the slightest operation of the kind," he remarks, "will sometimes re-excite the circulation of an eye that has been recently inflamed, especially tediously or sluggishly inflamed, and then new inflammatory films may result, depriving the patient of the benefit he has been led to expect, as well as disheartening him as to the effect of any future interference. Two needles," he says, "should be at hand, so that the second may be used if required. Both should be as fine as is consistent with strength; they should be cutting for the twentieth of an inch at the spear-points; the stem should be cylindrical, should enter and move backwards and forwards easily in the corneal puncture, which it should at the same time perfectly fill, so that no aqueous humour should escape until the instrument is altogether withdrawn, which should be done gently. The advantages of no aqueous escaping are that there is no bursting forwards of the vitreous through the pupil, no displacement or stretching of the pupillary margin or iris, and none of the pain and after ill-effects due to this latter cause alone. The single needle is to be used for thin films, but for denser or adherent films, which resist a single needle, the second one, held in reserve, is to be introduced with the other hand. The movements made should be slow and gradual, and the vitreous should be injured as little as possible."

¹ Ophthalmic Hospital Reports, vol. iv. p. 358, 1864-65.

The chief objections that I have found to it are that in cases of dense opacity, and in those where some iritis has followed the extraction, the needles fail to perforate the posterior capsule with moderate pressure; if the pressure be increased, it may be seen that the iris is following the motion of the resistant secondary cataract, and is being pressed backwards. One of three events may then occur—either the adhesions may give way in some part when the detached capsule can be momentarily depressed out of the line of vision, but reappears on the withdrawal of the needle; or some blood-vessels may be ruptured, and hæmorrhage into the aqueous humour take place; or, lastly, irido-dialysis may occur, which is also usually accompanied by considerable hæmorrhage. In both of the latter cases the prognosis is bad; effused blood in such eyes is not readily absorbed; the iris and sclera become stained with hæmoglobin, a deposit of lymph is left, and vision is worse than before. A second, though a minor objection to Bowman's two-needle operation is that under certain conditions of light, or rather unless the light is very favourable and the patient very steady, it is not easy to make the points of the two needles transfix the capsule at the same aperture. If this be not accomplished when the points of the needles are divaricated by bringing the handles together, an opaque band of the membrane is left, which is very annoying to the patient. The proper treatment in such cases is not to attempt to divide the band with the needles, but to withdraw them, and to allow complete recovery to take place. The band can be divided very easily at a subsequent period by making a small opening in the cornea with a v. Graefe's knife, and the introduction of a pair of Wecker's or of Weiss's cannula scissors, which are admirably adapted for this purpose, but require to be in perfect order.

It is to be noted, also, that in the act of divaricating the cutting points of the needles, a not inconsiderable amount of traction, and even some laceration, or at least bruising, of the corneal tissue may be effected by the stem of the needle. When the membrane is thin this does not, of course, occur; but where it is dense, and does not tear readily, it is a not unlikely accident; and I have both noticed its occurrence, and observed bad results. Thick membranes must not be attacked with two needles.

Schmidt Rimpler,¹ when the membrane is thin, uses one or two needles. If these fail, he attempts its division with a pair of Wecker's scissors, or endeavours to take away a portion altogether. These proceedings, however, he considers to be dange-

¹ *Augenheilkunde und Ophthalmoscopie*, 1888.

rous on account of possible laceration in the ciliary region ; but this, he thinks, may be avoided if at several sittings, and with favourable illumination, the secondary cataract is peripherally divided with the discission needle, and is thus separated from its connections with the ciliary body before the extraction is attempted. If there be extensive adhesion, iridotomy or iridectomy should be practised. These measures seem to me to be very appropriate.

Juler,¹ after describing the varieties of capsular cataract, proceeds to consider their treatment, observing that no operative proceedings should be had recourse to until all active signs of inflammation have subsided. The fine membranous opacities formed of capsule only can be readily torn through with cataract needles. For this purpose two needles should always be used, and the opening made by tearing from the centre. For the tougher membranes formed by lymph or lymph and capsule, needling is not sufficient. In the first place, it is difficult in such a case, even with the needles, to avoid making some traction, and if inflammatory symptoms follow, the opening made generally gets closed by fresh lymph. By far the most effectual proceeding, in his opinion, is to divide the membrane and the iris with scissors as in iridotomy.

The latest authority on the subject, Mr. Jessop,² expresses himself in these terms: "After-cataract is the name applied to the remains of capsule, lens matter, or products of inflammation found in the coloboma or pupil after an operation for cataract. Clinically they may be divided into two classes—non-inflammatory and inflammatory. (1.) The *non-inflammatory*, generally seen as fine cracks and lines in the pupillary area, are not adherent to the iris, and therefore do not interfere with the action of the pupil. They consist of remains of the anterior capsule or lens substance, and also of the opaque posterior capsule: they may not appear for months after the operation. They generally produce considerable loss of vision, and are easily treated under cocaine by breaking them up by means of a needle introduced through the corneal periphery. Occasionally it is advisable to employ a second needle passed from the opposite side, so that the capsule can be torn between them. (2.) The *inflammatory* cases are much more serious, and are the result of iritis or cyclitis. They consist of a more or less thick membrane occluding the pupil and bound down to the iris. The treatment in these cases must be put off till all signs of active inflammation have disappeared. Needles should never be used

¹ Ophthalmic Science and Practice, 1893, p. 343.

² Ophthalmic Surgery and Medicine, 1898.

to tear these membranes; and the best way is to introduce a thin Graefe's knife near the periphery of the cornea into the anterior chamber, and when the point of the knife has reached the limit of the proposed coloboma, the handle should be raised and the knife made to cut its way through the iris and membrane as far as desired, and then slowly withdrawn. Sometimes an iridectomy is the best treatment. Operations on after-cataracts, though sometimes easy, are always to be undertaken with great caution, as cyclitis, glaucoma, and even panophthalmitis may be set up."

After having thus noticed a few of the more recent references to this subject in works of accredited reputation and value, which by being thus brought together may be easily compared, I venture to make a few observations embodying my own experience.

The operation should not be undertaken at too early a period for several reasons. In the first place, the eyes of many persons, especially those of a gouty habit of body, will not bear two operations rapidly succeeding each other. Inflammation of the sclera, extending to the ciliary region and the iris, is apt to follow. Secondly, in healthy eyes in which the aqueous is freely secreted and freely passes off, absorption to a considerable extent may be expected to take place; and, lastly, division of the remains of the lens and the posterior capsule has little more effect in obtaining a clear pupil than the division of so much paste or boiled tapioca would have, since there is little or no elasticity in the softened lens substance, whilst portions of this material are likely to be pressed into the vitreous, in which case the absorption is very slow. I can recall several cases in which serious trouble resulted from the attempt to clear the pupil being made at too early a period. As a general rule, at least from eight weeks to three or four months, or even a year, should be allowed to elapse before the operation for secondary cataract is undertaken. It should not be practised until the conjunctiva and sclera in the neighbourhood of the primary wound have lost all trace of the injury, and have completely regained their natural colour. The temptation to meddle too soon with the eye is apt to occur both in hospital and in private cases—in the former, because the patient has often been sent from a distance, his bed is in demand for others, and it is inconvenient and expensive to send him backwards and forwards, having perhaps still considerably impaired vision, with directions to return in so many months. In private cases, the merchant or the clerk, the professional man or artist, is anxious to resume his work, and exerts more or less pressure on the surgeon

to finish the case. In either case, if the operation is performed before the eye has completely recovered itself, and whilst some lingering inflammation still remains, bad consequences are extremely likely to follow. Iridocyclitis may be set up, lymph be thrown out, and the sharpness of vision be temporarily, and perhaps even permanently, lowered. With such results in my memory, I endeavour to induce patients, at the risk of some disappointment on their part, to go into the country, or to cease to see me for three or four months, and if they are willing to wait for so long a time, I do not think a year at all excessive. The eye will then have quieted down and thoroughly recovered from the first operation, and the liability to subsequent inflammation is greatly reduced, whilst most of the absorbable material has undergone absorption. The degree of impairment of vision which renders it advisable for the patient to submit to a needling must vary with his avocation and requirements. The literary man, the business man, the professional man, are all desirous of being able to read ordinary print, such as the "leader" of a daily paper, whilst the mother of a family wants to be able to sew and keep household accounts. But there are a large number of persons who are satisfied if they can recover the power of guiding themselves without difficulty, of recognising faces, and the position, form, and colour of objects of moderate size, such as a book, a brush, a glass, or a flower.

The preparation of the patient for this delicate operation should be as carefully attended to as if it were in view of the extraction of a cataract. The bowels should be opened once or twice freely in the course of the preceding week by means of an aperient: a blue pill and black draught, though old remedies, are not to be despised, or such a combination as podophyllin, cascara, and euonymin. In other instances a spoonful of confection of senna will have the desired effect. The patient, if an inhabitant of a town, should be encouraged to take regular exercise, and if he can have a week in the country in spring or autumn, so much the better for him. His diet should be regulated, and wine and spirits ordered or withdrawn as may seem advisable. It should not be undertaken whilst the patient has a severe cough.

The division with one needle can only be safely practised when the membrane is exceedingly thin. The posterior capsule and hyaloid membrane are not so elastic as the anterior capsule, or at least when divided do not gape so widely. The needle should be flattened, and have exceedingly sharp edges, and it should not be plunged too deeply into the vitreous humour.

Some of the older operators, as we have seen, used to perforate the membrane, and rotate and circumduct the point of the needle freely ; sometimes with good effect, but sometimes with the result that portions were left in the form of bands and plaques, which caused luminous objects to have an iridescent fringe of colours. Moreover, new membranes often form if the vitreous be too freely incised and lacerated. The principal danger in this method of dealing with secondary cataract is that traction is exerted through the suspensory ligament, and through the adhesions which often form between the iris and the remains of the lens, upon the ciliary region ; iridocyclitis is thus set up, the media become hazy, the fundus of the eye can no longer be seen with the ophthalmoscope, the iris assumes a darker hue, and vision is deteriorated to so great an extent that little more than bare perception of light and darkness is left. Nor is the condition of the eye the only thing the ophthalmic surgeon has to consider. The pain occasions almost sleepless nights ; the patient, awakening from short and unrefreshing slumber, loses his appetite, and is greatly depressed in spirits at the rapidly increasing loss of vision ; and many weeks often elapse before the failure of the apparently trifling operation ceases to trouble him.

The method I have myself of late years generally followed is to use a very long, very narrow, and very sharp double-edged knife, bent at an angle approaching a right angle, with the handle like an iridectomy knife. The length of the blade is half an inch, and the width one-eighth of an inch. After the application of two or three drops of a 4 per cent. solution of cocaine, at intervals of three minutes, till the conjunctiva and cornea are insensitve, the lids are separated with a spring speculum. The lower part of the conjunctiva is seized with a pair of toothed forceps, and the point of the knife is made to penetrate the upper part of the cornea near its margin. The blade is steadily pushed forward till it reaches and passes behind and beyond the pupillary border of the iris. This should be accomplished without any escape of the aqueous humour. By a lateral movement of the handle of the instrument, the cutting edge divides the capsule near the attachment of the suspensory ligament. In some instances an excellent pupil is formed by this manœuvre alone ; but when this does not occur, the knife should be withdrawn, and a blunt Tyrrell's hook introduced, and the free border of the capsule engaged in it. Traction can thus be exerted until the formation of the pupil seems to be sufficient for the free admission of light. In some cases, where the adhesions are slight or the suspensory

ligament is weak, the whole of the secondary cataract can be separated and withdrawn, leaving a beautifully clear pupil, which is not likely to be again clouded. If, however, on attempting to use the Tyrrell hook, it is manifest that traction to a dangerous extent is made upon the iris, the surgeon should introduce a Graefe's knife at the upper border of the cornea, and pass in a pair of Wecker's or of Weiss's cannula scissors through the small opening thus made in the cornea, dividing the membrane from its upper edge downwards.

I have never introduced the needle through the sclerotic and behind the iris, but can well believe that in some cases a good result might be secured by this means; but the general conclusion at which, after forty years' experience, I have arrived, is that an operation for secondary cataract should not be lightly undertaken, and that after its performance the case should be very carefully watched for several days. I conclude these remarks by giving the views of some of the principal operators and their modes of operating.

Mackenzie,¹ after describing the character and different forms of capsular secondary cataract, remarks: "It is proper to try whether we cannot form a sufficient central aperture with the needle when a capsular secondary cataract occupies a great portion of the field of the pupil. We often succeed in doing so, and find that the shreds into which we tear the obstructing membrane retreat behind the iris. But in many cases the capsule resists this mode of treatment. In the transparent state the capsule is easily torn through, but it is otherwise when it has become opaque and thickened by inflammation. In this state it is so tough and elastic that we cannot divide it; we may carry it on the point of the needle almost to the bottom of the vitreous humour, whence it instantly springs up again to its former situation. It may sometimes be gathered round the curved needle, separated from its connection and depressed, but it seldom remains long in its new situation. I have sometimes succeeded in twisting a capsular secondary cataract round a curved needle by rotating the needle, and then drawing the capsule towards the aperture in the sclerotica, have left it fixed there as I withdrew the needle. The iris and ciliary body, to which the capsular secondary cataract is often attached, are liable under such attempts to be stretched and injured, and sometimes the iris is detached from the choroid. Serious inflammation is also prone to follow such operations." He proceeds to describe Mr. Bowman's method with two needles, then recently proposed, and the mode of using the cannula forceps

¹ Practical Treatise on the Diseases of the Eye, 4th ed., 1854.

and scissors. It is obvious that the cases to which Mackenzie alludes in the above extract could be now satisfactorily dealt with either by the introduction of Wecker's scissors or of Weiss's cannula scissors or forceps.

Dr. Agnew¹ recommends the introduction of a stop-needle on the nasal side of the cornea, about a line from the sclera. The point is made to penetrate the obstructing membrane near its centre, especial care being taken not to injure the pupillary margin of the iris. While the stop-needle, held immovably, fixes both the eye and the membrane, the operator makes a linear incision in the cornea on the temporal side, parallel with the margin, and about half a line distant from it. A broad needle, a Beer's knife, or a lance-knife may be employed, and should be withdrawn with little or no loss of aqueous humour. Through the linear incision a small sharp-pointed hook is carried into the anterior chamber, and its point is engaged in the same opening in the membrane as that of the stop-needle. The membrane is now to be torn, and to be rolled round the hook as far as possible by a rotatory movement of the latter. When thus rolled, the hook and the membrane may be withdrawn from the eye together. When this cannot be accomplished, the membrane may still be torn widely open after the hook is withdrawn; the stop-needle must be withdrawn also, and the operation is completed. A few drops of a solution of atropin (two grains of the sulphate to an ounce of water) should be applied. The after-treatment consists of cold compresses and rest in bed for three days. I can hardly think that Dr. Agnew had practised these proceedings on many occasions. In the first place, if the capsule be tough, as it often is, the attempt to penetrate it with a stop-needle is more easily said than done, for it simply retires before the point, dragging with it the iris, to which it is usually adherent, with varying degrees of firmness, as far as the stop on the needle will allow. In the next place, it is not easy, when one needle has traversed the cornea, to introduce a broad needle, a Beer's knife, or a lance-knife into the anterior chamber and withdraw it again with little or no loss of aqueous humour. Further, although a small sharp-pointed hook may be introduced through the wound made by the broad needle, and may be made to grip the capsule, the entry of the curved point into the same spot as that in which the point of the stop-needle is already engaged and the tearing movement are not easily accomplished; and finally, the sharp-pointed hook, as I have found on several occasions, is not readily drawn through the small

¹ Ophthalmic Hospital Report, vol. v. 1866, p. 239.

opening made by the broad needle in the cornea without inflicting some injury upon that membrane.

No doubt some of the precautionary measures that should be adopted in cases of secondary cataract, some of the operative proceedings to be practised, and some of the difficulties that are likely to arise, as well as the mode in which they should be met, are to be found under the head of "discission" of soft cataracts; but whoever will take the trouble to examine the recent numerous manuals, text-books, and treatises on diseases of the eye, will certainly be surprised at the small space that is accorded to the consideration of this troublesome and disappointing sequela of a well-performed and otherwise successful operation for the extraction of cataract.

Take, for example, the excellent work of St. John Roosa, an accomplished and very practical American surgeon. In his "*Clinical Manual of Diseases of the Eye*" (1894) the subject is dismissed in the following summary fashion: "Operations for secondary cataract on membranes consist usually in making a small hole through the membrane by tearing it with needles (called a 'needling') or forceps, or by cutting it with a knife or a special form of scissors"—from which the inference might be drawn that any one of these instruments may be selected almost at hazard, that the period after the operation is of no importance, that the density of the membrane and its adhesion or non-adhesion to the iris is not worthy of consideration, and that no serious complications are to be anticipated.

Vossius, again, in his "*Lehrbuch der Augenheilkunde*" (1892), treats the subject very lightly, only remarking that the most frequent complication after extraction is the occurrence of a secondary cataract, adding, after an explanation of its nature, that an improvement of vision can only be obtained by operative procedure, as by discission or by Wecker's method of iridotomy with scissor forceps.

Mr. Nettleship¹ remarks: "In slight cases, where the pupil is not dragged out of place, sight is greatly improved by simply tearing across the membrane a capsule with a fine needle and treating the case as after discission of soft cataract. In doing this the needle should be passed deeply enough to tear the posterior capsule, also so that the vitreous by bulging forward may keep the opening in the capsule patent (compare discission of soft cataract), in which care is taken *not* to go so deeply." But in severer cases an artificial pupil must be made either by iridectomy or iridotomy, operations that he elsewhere describes.

¹ *Diseases of the Eye.* Edited by W. T. Holmes Spicer, 1897, p. 393.

Even Ernst Fuchs¹ gives but a meagre account. This is all: "The dilaceration of a membranous cataract is an operation of little importance providing there are no adhesions between the cataract and the iris. If there be, there is danger of lacerating the iris, leading to iridocyclitis. Simple discission should only be practised when the opaque membrane is so thin that it can be torn across without danger of laceration (of the iris). When the membrane is thicker, the method of operating suggested by Bowman, which he describes, may be adopted. When the synechiæ are extensive the discission should be preceded by an iridectomy, or discission may be superseded by an iridotomy."

In the French (1892) translation by Drs. Lacompte and Leplat of Fuchs' work, some additional observations precede the above account: "By the discission of membranous cataracts it is not attempted to effect absorption, since shrivelled cataracts contain little or no material capable of being absorbed. The object in view in tearing across a membranous cataract is to obtain a free opening. This operation should therefore be termed dilaceration of cataract. It can be practised either through the cornea or through the sclerotic. When the operation through the cornea (keratonyxis) is performed, the puncture should be made at the centre of the infero-external quadrant of the cornea, as in the discission of a soft cataract. The needle is made to penetrate the cataract which it is desired to tear by making free lever-like movements of the needle in all directions to enlarge the opening as much as possible.

"When the operation is done through the sclera (scleronyxis), the point of the needle is made to penetrate the sclera perpendicularly at a distance of about 6 millimetres behind the margin of the cornea, a little below the horizontal meridian, pushing it forward so that the point may appear in the anterior chamber near the external border of the pupil. Then with lever-like movements executed from before backwards, as large an opening as possible should be made by tearing the cataractous membrane. The difference between the scleral and the corneal operation is that in the former mode of operating more pressure can be exerted on the cataract, which is desirable when the cataract is thick "

Abadie² makes an incision in the cornea with a lance-shaped knife, and passes a pair of curved toothed forceps into the anterior chamber to seize and extract the membrane.

Macnamara,³ after pointing out that much care is requisite,

¹ *Lehrbuch der Augenheilkunde*, 1889, p. 744.

² *Traité des Maladies des Yeux*, 1876.

³ *A Manual of the Diseases of the Eye*, 1876.

recommends the employment of one or two needles or the performance of an iridectomy and the division of the membrane with a pair of Wecker's scissors.

S. Klein,¹ after commenting on the difficulties and dangers of the division of secondary cataract, approves of de Wecker's iritomy or iridotomy, and uses that operator's scissors.

Dr. Swanzy² observes that the term secondary cataract, as here used, usually means a closure of the opening in the anterior capsule left after the removal of a cataractous lens, with sometimes a thickening of the capsule by which an impediment is offered to the rays of light in passing through the pupil. The thickening may have pre-existed in the capsule, or it may be due to subsequent proliferation of the epithelial cells on the inner surface of the capsule. The term is also used in reference to those cases in which no central opening has been made in the capsule (peripheral capsulotomy), and where the latter causes imperfect vision. It is also used in those cases where, after cataract extraction, an exudation in the pupil consequent upon iritis has occurred. Finally, and most incorrectly, it is applied to the cases in which, after suppuration of the wound with iridocyclitis, the iris is dragged upwards and the pupil consequently obliterated (a drawing of which he gives). In simple cases it is easy, he says, to make a rent in the delicate membrane with a discission needle, but when there are thick opacities in the capsule or inflammatory exudation into the pupil, with probably adhesions of the iris to the pupillary membrane, extraction of the latter has been proposed and practised, but is associated with so much danger, from the unavoidable dragging on the ciliary body and iris, that the proceeding is not often employed. Sir W. Bowman's method with two needles (which he describes) is here much preferable. Dr. Noyes' method is then referred to, and Wecker's plan of iridotomy. Iridectomy, he says, rarely succeeds in those cases where the iris is drawn up; iridotomy is then preferable.

Panas³ devotes rather a long chapter to the subject. He observes that those cataracts formed by the remains of the capsule with the addition of cortical layers, and sometimes of plastic deposits, are seen after incomplete extractions or after wounds of the lens. All varieties occur between the arid siliquous form characterised by its complete want of transparency, and a membrane that is merely opalescent. From the eighteenth century secondary cataracts attracted the atten-

¹ Lehrbuch der Augenheilkunde, 1879.

² Swanzy, Handbook of the Diseases of the Eye, 1897, p. 387.

³ Ph. Panas, Traité des Maladies des Yeux, 1894, vol. i. p. 600.

tion of Deider, de Hoin, and especially of Saint Yves and de Beer. Roquetta¹ was the first to suggest the employment of an *emporte-pièce* destined to perforate the septum. The first thing to be done is to clear the pupillary field. Those cataracts which are easy to extract, like the sclerosed and Morgagnian, present much less liability to this complication than those which are immature and soft. It goes without saying that when a capsulo-lenticular cataract is the subject of operation, and the capsule is not removed, consecutive cataract necessarily forms.

Inasmuch as iritic exsudates take part in some of these cases, antiseptis, by suppressing post-operative inflammations, diminishes their frequency. Whenever the vision is unsatisfactory, interference becomes necessary, which may be dispensed with when there are only delicate membranules which do not seriously impair the vision. There is a middle path to be followed between Knapp, who recommends discission in all cases, and Gayet, who rarely interferes.

The period of intervention is not a matter of indifference. As a rule, Panas prefers to wait till all inflammatory symptoms have disappeared and the capsule is well organised, so that it may be more easily seized by instruments—a period that may extend from six weeks to two months. The methods of dealing with the affection vary. In the case of fine membranules without any synechiæ, a single needle may be sufficient in preference to the two recommended by Bowman,² whilst some prefer a Graefe's knife or the fine serpette of Knapp.

The only precautions to be taken are antiseptis and the dilatation of the pupil. In order that the field of operation may be well illuminated, a small electrical photophore is usually employed, which should be held obliquely by an assistant. The lid speculum being then introduced, and the globe fixed by means of forceps, the discission needle is introduced above in one of the oblique meridians of the cornea about 2 mm. within the periphery. The little cicatrix thus made is masked by the upper lid. The point of the needle having penetrated as far as the pupillary field, the capsule is divided vertically to the extent of 4 or 5 mm. or more; a second crucial incision may then be made. This done, the needle is slowly withdrawn to prevent a sudden rush of the aqueous humour, the application of the iris and the introduction of a flap of capsule in the aperture of the wound. When the two needles of Bowman are used, that one which is held in the left hand is first plunged in, and then the

¹ Bull. génér. de Thérap., 1834.

² Med. Times and Gaz., 1852.

other guided as before. The two points are made to converge towards the middle of the membrane, and they are then made to separate so as to draw back the two halves of the capsule. This manœuvre should be repeated till the flaps of capsule have no more tendency to return to the centre of the pupil.

At first one is tempted to believe there is nothing easier than this little operation, and that the traumatism is so slight that no injurious effects are to be anticipated from any inflammation of the whole eye. But for various reasons this is not the case.

If, generally speaking, it is easy to tear across membranous cataract, nothing prevents the flaps from coming into contact again as soon as the vitreous plug retracts. On the other hand, the degree of penetration of the needles must be carefully considered beforehand. When the movements of circumduction are made, a certain quantity of the aqueous flows away and the vitreous projects itself against the needle, which penetrates deeply and may occasion a consecutive hyalitis.

In the case of resistant secondary cataracts, frequent dragging of the zonule reacts on the ciliary processes, which is again a cause of inflammation. In other cases the weakened zonule of Zinn is torn by the needle, and renders any further manœuvre impossible. M. Panas elsewhere insists on the frequency of capsular inclusion in the course of the wound. He adds that the establishment of a corneal fistula and of an anterior synechia of the iris are not very infrequent.

Supported by considerations of this kind, and on the simplicity of total extraction, he has for many years adopted almost exclusively this last method of operating.

Putting aside the fine membranules that can be divided with the cutting needle of Knapp, he has made a general rule of extracting secondary cataracts, and the following is the procedure practised. Peripheral puncture of the cornea with the triangular knife at the level of the old cicatrix to the extent of 5 mm.; rapid withdrawal of the knife to prevent the escape of the aqueous and the introduction of the modified forceps of Liebreich, which serves to seize the membranous cataract after having perforated it with its posterior pointed arm. Gentle traction to and fro detach the adhesions from the zonule and permit the whole of the capsular sac to be drawn outwards with the masses it contains. Very rarely he has employed the loop crochet of Langenbeck, modified by substituting at the foot a screw of more convenient action. When the membrane resists feebly, only the centre is torn away, which is sufficient for optical purposes, and always superior in effect to that obtained by discission. In both cases the loss of vitreous is

small or nothing, and the eye scarcely reacts; delicate synechiæ break down, which at once restores the mobility of the pupil. Whenever there is an affair of iritic adhesions of moderate extent or complete, this proceeding is no longer applicable, and an irido-capsulotomy must be resorted to.

Henry Noyes¹ gives one of the best accounts I have met with of secondary cataract. "In a large proportion of cases," he says, "some membraniform obstruction appears in the pupil after the operation. We have every grade, and may speak of the simple and the complicated secondary cataract. The *simple* may be extremely thin and nearly transparent, or quite thick and opaque." The condition of the capsule after escape of the lens is then described in a manner similar to the account given by Becker. In regard to the mode of operating, he recommends, in simple cases, "discission by a single straight needle, which is made to enter the anterior chamber by perforating the cornea at its outer border, the cut being made horizontally from the inner to the outer side. Mr. Bowman's plan of using two needles must be adopted for thicker opacities, and in all cases where it is used care must be taken not to drag on the ciliary region. For similar cases, Graefe's iridotomy knife is used, being put into the cornea perpendicularly and near the level of the dilated pupil. A thick and non-adherent membrane may be sometimes best attacked by a needle passed through the sclera behind the iris, which will both cut and displace it, provided there is no ciliary irritation. Under all precautions, both operative and antiseptic, he has seen disastrous reaction follow a faultless discission. Though so simple in appearance, his inclination is not to resort to discission until the eye does not redden under rather rough handling, and thus observes all the cautions above mentioned.

Complicated secondary cataracts present extremely various conditions. We may have merely slight adhesions to the iris, or these may be very extensive. In the latter case the iris is usually dragged up to the wound, and the membrane may be very thick or otherwise. With a thin membrane, a knife-needle will cut the adhesions and open the membrane, and may be used to sever their fibrous bands, which drag the iris towards the ciliary region. But such interference must be very cautiously attempted.

With a thicker membrane and broad iritic attachment an iridectomy downwards may be suitable, and if a membranous obstruction be revealed, a subsequent needling may be performed.

¹ Text-Book on Diseases of the Eye, 2nd edit., 1894, p. 507 *et seq.*

For a thick membrane, with few adhesions to the iris, Dr. Agnew's method may be used. At the upper edge of the cornea a broad needle pierces the capsule and is held steady. At the opposite side, on the margin, a wound is made for the introduction into the anterior chamber of a small sharp hook, whose point is engaged in the wound made by the broad needle. Securing a good hold, the hook tears down the membrane, and is resisted by the needle in the operator's other hand, which also defends the ciliary region from traction. As much tissue is drawn out of the wound as possible, and cut off by an assistant with scissors.

Sometimes we have to deal with very complicated conditions. There has been iridocyclitis, and we have to deal with an inflammatory product, composed of the iris, the capsule, and the newly-formed connective tissue, which will be highly vascular, tough, and often under unusual tension. The structures are matted together, and bleed easily on being touched. An operation should not be attempted until all irritability of the eye has disappeared. If the globe is soft, the prognosis and the difficulties are grave. Dr. Loring has had success in some of these cases by cutting horizontally through the obstruction with a narrow Graefe's knife, plunged into the vitreous with a sawing motion, thus effecting a free division of the membrane.

In one of the most recent authoritative works on diseases and operations of the eye, that of MM. Truc and Valude, in which the subject is very summarily dismissed, it is observed that in simple secondary capsular cataract "no operation need be practised; but if the sharpness of vision is insufficient, discission with one or two needles, or with the linear knife of Graefe, is advantageous. In cases where there are débris of the lens with the secondary capsular cataract, dilaceration with two needles may be sufficient. Hooks are sometimes employed, which are introduced through an incision on each side of the horizontal diameter of the cornea; usually, however, it is better to adopt iridectomy or irito-ectomy with Wecker's scissors. Da Gama Pinto has proposed a new and very ingenious mode of section of the membranule by means of a special knife, introduced through the sclerotic behind the iris, and without opening the anterior chamber. The advantage of this procedure is that a subconjunctival wound is made, and no vitreous is introduced into the anterior chamber.

In the *Revue Générale d'Ophthalmologie* for 1896 a description is given of the instrument used by Professor Stilling for the division of secondary cataract by Dr. Weill. It is a lance with the extremity recurved, and cutting like a halberd of the Middle

Ages. It is made to penetrate by the point, and the membrane is divided with the cutting edge. M. Valude, in describing it, remarks that it is more damaging to the eye than any of the instruments in common use, and the more so as Professor Stilling uses two such instruments simultaneously.

E. Fick¹ says: After the extraction of the cataract the fragments of the anterior capsule are pressed out of the pupillary area—if everything goes well—and, resting on the posterior capsule, they finally become adherent to it. Capsular epithelium and the remnants of the cataract are therefore removed from the irritating action of the aqueous. The nutritive cells at the lens equator do hypertrophy, to be sure, but they become changed into normal lens fibres as far as their physical characteristics, if not their form, is concerned. The contents of the intercapsular space consists of new-formed transparent lens substance, and of cataract débris, called lenticular membrane. Any eye operated on and found in such a condition shows a black pupil; but by focal illumination there is seen behind the pupillary plane a delicate, striated, silk-like, often tremulous membrane—the posterior capsule. Unfortunately, this typical condition is not always present. The fragments of the anterior capsule do not always withdraw from the pupillary area, nor adhere early to the posterior capsule; for this reason the débris of the cataract swells up in the anterior chamber, the epithelium of the capsule continues to grow, and as a result of this activity there is seen in the pupillary area a delicate or tough grey membrane, the simple secondary cataract. Visual acuity may be reduced to counting fingers. Even this is not the worst that can happen. In many cases the capsular fragments adhere to the iris or to the edges of the wound, a condition termed *cataracta secundaria accreta*. The contraction in the cicatrix, the movements of the iris and ciliary muscle, all drag continuously on the secondary cataract, which gradually increases in prominence through this irritation; the contraction in the secondary cataract too drags on the suspensory ligament and ciliary body, and provokes a chronic cyclitis. In consequence of all this, the adherent fragments may develop into a tough membrane, and the eye gradually perish by atrophy. Fortunately, however, the eye in most cases calms down after a few months, so that the operative treatment of the secondary cataract may be considered. The treatment is discission. After thoroughly atropinising the eye, the largest possible hole in the membrane should be torn with a discission needle, or cut with a Graefe's knife exactly at the centre. If the membrane is so

¹ Diseases of the Eye, 1896. *Cataracta Secundaria*.

tough that a dangerous dragging on the ciliary body is to be feared, dilaceration should be substituted for discission. Dilaceration consists in piercing the centre of the membrane with two needles, and then by a leverage motion in tearing as large a hole as possible from the centre towards the edge. Although the injury itself is trifling, there is developed at times after operation on secondary cataract a cyclitis resulting in phthisis bulbi, or even panophthalmitis. One must be careful, then, not to operate before the irritation caused by the first operation has completely subsided. On the other hand, the delay should not be unnecessarily long, since a recent secondary cataract is more delicate than an old one, and since the contraction going on helps to keep open a hole made of reasonable size. If the wound from the first operation heals kindly, the proper time for discission of the secondary cataract will be about two months afterwards. Many surgeons say that discission of the secondary cataract by a fine scissors forceps introduced into the anterior chamber is free from the dangers of discission. I have had no experience in this method.

C. Schweigger¹ dwells on the importance of oblique illumination for the due examination of secondary cataract. Fine and delicate membranes he divides with two needles. Thicker opacities are, he thinks, best treated by discission with iridotomy scissors, and if synechiæ are present, they should be extracted with a fine pair of forceps.

It thus appears from the concordant testimony of many skilful operators that the treatment of secondary cataract is not to be lightly or incautiously undertaken. The conditions present in each case should be carefully studied, and the effects of interference watched for some days. There are many methods of attacking the occluding membrane, but the cardinal point in all is to do as little violence to the adjoining tissues as possible.

¹ Handbuch der Augenheilkunde, 1893.



FIG. 1.—SKIAGRAM OF HEALTHY THORAX.



FIG. 2. - SKIAGRAM OF LUNGS OF FETUS THAT HAD NEVER BREATHED.
SHOWING THAT THE LUNGS ARE OPAQUE TO THE RAYS.

THE X-RAYS IN DISEASES OF THE CHEST.

BY

HUGH WALSHAM, M.D.

The experience of the last three years has been quite sufficient to prove beyond question the usefulness of Professor Röntgen's discovery to the surgeon. I venture to think, however, that a systematic application of the rays to the diagnosis of chest disease will prove of equal value to the physician. From some cause the X-rays have, up to the present time, not been so extensively used by the physician as they have been by the surgeon, and yet they are capable of showing very distinctly pathological conditions within the chest. What little I have been able to do in the Electrical Department of the Hospital thoroughly convinces me of their great value in chest disease, more especially in disease of the lungs. This, I think, will be quite apparent from an examination of the accompanying skiagrams. The first (Fig. 1) is from the chest of a perfectly healthy boy aged nine years. It is seen at once that both lungs in a healthy condition are perfectly transparent to the rays from apex to base, allowing the posterior portions of the ribs to be clearly seen. Some slight shading is visible on each side, corresponding to the position of the larger bronchi, but with this exception the healthy lung is quite transparent to the rays. Whether this transparency continues with advancing life I am not quite sure; probably it does not. I think, as life advances, the lung becomes somewhat less transparent, but this, of course, affects the whole lung equally, and therefore may be neglected from a diagnostic point of view.

Fig. 2 is the skiagram from a fœtus that had never breathed (perforation case). Here the lungs are quite opaque to the rays—at least they are as opaque as the surrounding tissues except the bones. May not the X-rays be found useful in helping to decide that difficult medico-legal question as to whether a child has breathed or not? If we now turn to

Fig. 3, we see that there is a great difference if we compare it with Fig. 1. The skiagram is from the chest of a boy aged fifteen, who came under my care when in charge of Dr. Harrington Sainsbury's wards at the City of London Hospital for Diseases of the Chest during the past summer. Physical examination of the chest gave signs of cavities at both apices. On the left side, the physical signs of the cavity extended from the apex downwards to the level of the third rib. I was, therefore, surprised, on examining this patient with the fluoroscope, to find that the cavity was comparatively a small one, certainly not extending so far down as auscultation led me to believe. I think massive tubercular consolidation round a cavity will conduct the sounds heard in the cavity far beyond the actual limits of the cavity. The cavity at the right apex was also smaller than one would have expected from auscultation. The cavities are well marked as two more or less clear round spaces surrounded by dark shading. The posterior portions of the ribs are clearly seen crossing the back of the cavities. It must not, however, be thought that all cavities in the lungs will come out with the same distinctness. I am sure this is not so. For cavities to show well they must be superficial, empty, and have a thin wall. A cavity buried deeply in lung-tissue, or nearly full of pus, will only display its presence by a dark patch of shading with a somewhat lighter middle. This is well seen in Fig. 4. It is the skiagram of the chest of a boy aged eleven years. Auscultation gave evidence of a cavity at the right apex. It will be seen that a large portion of the right upper lobe throws a dark shadow on the plate, but with a lighter middle near the apex. The left apex also shows some commencing tubercular consolidation displayed by tracts of shading. On looking at the lower lobes of the lungs, we see (Fig. 3) varying degrees of transparency mixed up with tracts of shading. This shading corresponds, no doubt, with consolidated lung-tissue, but partly perhaps with pleural adhesions. The diaphragm, also, stands too high on the affected side. I have had the opportunity of taking a skiagram of a pleural effusion (serum). It shows a uniform darkening of the affected side up to the level of the fluid, quite unlike the mottling of the lung in pulmonary tuberculosis. The diaphragm also stands lower on the affected side. I think it is very probable that, with the aid of the X-rays, we may be able to distinguish between serum and pus, but at present I have not had an opportunity of making the observation. Early cases of tubercular consolidation of one or other apex displays its presence by a shading at that apex, probably before physical signs



FIG. 3.—SKIAGRAPH OF CHEST OF CHRONIC PULMONARY TUBERCULOSIS, SHOWING
CAVITIES AT BOTH APICES.



FIG. 4. TUBERCULAR CONSOLIDATION OF RIGHT APLA.



FIG. 5.—ENLARGED BRONCHIAL GLANDS OF CHEST WITH PHYSICAL SIGNS OF ENLARGED BRONCHIAL GLANDS.



FIG. 6.—PERSON PHYSICIS LEFT LEG.



FIG. 7.—ANEURISM OF TRANSVERSE AORTA.

become well marked. Enlarged bronchial glands, according to Professor Bouchard,¹ are easily distinguishable by the X-rays. I have put this statement to the test, but with a negative result. A boy aged nine years, with all the classical signs of enlarged bronchial glands, Dr. Eustace Smith's sign being especially well marked, came under my care at Great Ormond Street Children's Hospital, but the skiagram, with perhaps the exception of a slight broadening of the shadow at the base of the heart, was normal. (See Fig. 5.)

Fig. 6 is from a case of fibroid phthisis affecting a woman aged twenty-six. It will be seen that the left lower lobe is markedly affected. It also shows well the contracted condition of the left side of the chest. The X-rays are valuable in accurately determining the position and size of the heart, and fully confirm Professor Stark's² observations on the position of the organ in childhood. The rays also show well the swing of the heart from left to right in different positions of the body. Bearing this fact in mind, it may perhaps become possible to diagnose an adherent pericardium—at least when the pericardium is adherent to the chest-wall. I have quite lately had an opportunity of taking skiagrams of some cases of aortic aneurism. Fig. 7 shows one of these; an aneurism is seen distinctly on the descending aortic arch, thus quite clearing up the diagnosis, which before was somewhat doubtful. The accompanying skiagrams were all taken with a 10-inch coil worked by two storage batteries of about 16 volts.

A tube of moderate penetrative power was used. It is, I think, important in taking skiagrams of the chest for suspected lung disease not to use a tube of too great penetrative power, lest we render parts transparent which ought to be opaque. Again, the distance of the tube from the chest-wall is also an important point to attend to (especially in taking skiagrams of the heart), or very erroneous ideas may be formed of the size of the organ. Much still remains to be done in this department of physical diagnosis, and it requires a far larger experience than we already possess before we shall be able to speak with confidence as to the meaning of the shadows which the X-rays cast before us.

¹ Congress of Tuberculosis, Paris, 1898.

² "The Situation of the Apex of the Heart in Infancy." *Arch. f. Kinderheilkunde*, ix. 4-5; also in *Rev. Mensuelle des Maladies de l'Enfance*, 1888, p. 515.

STANLEY'S CASE OF PATENT URACHUS, WITH OBSERVATIONS ON URACHAL CYSTS.

BY

ALBAN DORAN, F.R.C.S.

WHEN preparing—a year since—a memoir based upon a case in my own operative practice,¹ I was struck by a certain resemblance between Specimen 2419 in the Pathological Collection in the Museum attached to St. Bartholomew's Hospital and a report of a case under the late Mr. Stanley's care, published by him in the third volume of the Transactions of the Pathological Society of London. There is no mention either of that report, or even of the bare name of Stanley, in the note on No. 2419 in the Museum Catalogue, but that valuable publication, on the other hand, names Savory as the describer of the specimen, and refers us to the second volume of the first part of the Transactions of the Abernethian Society; yet in those now venerable archives I find no note either of Mr. Stanley or of his report.

After a troublesome search amidst original documents, in which labour I was greatly assisted by Dr. Morley Fletcher, I have come to the conclusion that the two cases are identical. As the subject specially concerns St. Bartholomew's Hospital, and is interesting in itself, I think that a copy of the aforesaid documents ought to find a place in the Reports, so as to save trouble to those who may work in future at diseases of the urachus. Otherwise the copies of the documents in my possession would remain forgotten in my note-books. This statement requires a little further explanation. The contribution which I prepared for the Royal Medical and Chirurgical Society was not a treatise on diseases of the urachus, but a clinical paper on true urachal cysts. I briefly sketched, however, allied affec-

¹ A Case of Cyst of the Urachus, with notes on Urachal and so-called "Allantoic Cysts" (Medico-Chir. Trans., vol. lxxxi. 1898). This paper includes numerous references.

tions, such as urachal fistula and patulous urachus, and this sketch involved some notice of Stanley's case. In looking up that case, I came across the difficulties above noted, whilst, after all my trouble, I had to content myself with a short statement of the discrepancies in the original documents. Whilst, then, there was no place for a full copy of the documents in my memoir on cysts of the urachus, I think that such a copy is suitable for insertion in the St. Bartholomew's Hospital Reports.

I will therefore begin by comparing the documents. Afterwards I will say something on the study of the urachus and its diseases.

By "the documents" I mean—

(1.) The original report, signed by Stanley, in the Transactions of the Pathological Society, vol. iii. p. 127.

(2.) The note on No. 2419 in the Museum Catalogue.

(3.) The original MSS. report on Stanley's case, written by Dr. Kirkes, as "transcribed from Mr. Stanley's private notes."

(4.) The report of the exhibition of No. 2419 at a meeting of the Abernethian Society. As in (2), the only name mentioned is that of Savory.

(1.) From the first to the current volume of the Transactions of the Pathological Society, I find no contribution devoted to patulous urachus or urachal cyst. The paper in vol. iii. to which I refer is headed "Polypous Excrescences of the Bladder," without any mention of patulous urachus. The latter condition is, however, noted in the Society's Index to vols. i.-xv. as "Pervious Urachus," and from this reference I found out the paper, which I reproduce below.

"Polypous Excrescences of the Bladder."

"These tumours grew from the mucous membrane of the bladder of a male child, aged two years. The child had for several months suffered from irritation in the bladder; the character of the symptoms being such as to lead to the suspicion of the existence of stone; and in consequence repeated examinations of the bladder, by the sound, were made, but no stone discovered. About a month before death, the walls of the abdomen, through the hypogastrie (*sic*) region, became tense and acutely painful, and at a point just below the umbilicus, fluctuation being, after a little while, discovered, a puncture of the integuments was here made; from the aperture there issued first some fluid resembling urine, and then about

two ounces of pus. From this time to the child's death the whole of the urine was discharged through the opening in the abdominal walls, none passing through the urethra; but this was accompanied by gradual sinking of the vital powers.

"On examining the body, numerous soft, membranous pedunculated growths from the mucous membrane of the bladder were found projecting into, and in great part filling its cavity. An abscess had formed between the recti-muscles and peritoneal lining of the abdominal walls. This abscess extended from the umbilicus downwards to the fundus of the bladder. The tube of the urachus was pervious, and it opened into the cavity of the abscess; whilst at its upper part the abscess communicated with the aperture which had been made by puncture in the abdominal walls. The kidneys were much hypertrophied.—*Mr. Stanley, May 6, 1851.*"

This report has seldom if ever been quoted. It is otherwise with the Catalogue note of the specimen in the Museum, which has quite recently been referred to by Mr. John Morgan.¹

(2.) Hence I have introduced the Catalogue note here—

"A Descriptive Catalogue of the Anatomical and Pathological Museum of St. Bartholomew's Hospital.

"2419. A bladder laid open by vertical incision through its anterior wall. A pedunculated growth is attached to its inner surface, stretching transversely across the fundus of the bladder, immediately behind the apertures of the ureters, which are much dilated. The mass is attached at either side, but free in the centre, and was so situated that it might lie forward over the urethral orifice, or be propelled in that direction when attempts were made to void the urine. The tumour, irregularly lobulated, consists of a fine filamentous structure, scattered through a granular substance, and invested by a quantity of tessellated epithelium. The walls of the bladder are much thickened. At its upper surface the cavity of an abscess commences and extends to the umbilicus, but no communication can be traced between the two, although the urine continued to escape by the abscess up to the time of the child's death. The small papilla close to the vesical termination of the abscess is all that appears of the urachus. A bristle passed some way down it, but could not, without violence, be forced into the bladder.

¹ "Lettisomian Lectures," Lecture III., *Lancet*, March 12, 1898, p. 710.

"From a child who had suffered for eight weeks from extreme pain during micturition, presently followed by severe pain in the abdomen. A swelling formed about the umbilicus, softened, and was opened with a lancet, some healthy pus escaping. Urine began to dribble away from this opening, scarcely any escaping from the natural channel. The child, after lingering in a wretched state for some days, died. The case is described by Mr. Savory in the Transactions of the Abernethian Society, Part I. vol. ii."

Thus the late Sir William Savory bears the honour of having investigated this specimen. The note further suggests that he was the operator. We will now turn back, however, to another document by Stanley, where we indeed find a junior coadjutor, but he was not Savory, but Kirkes, so familiar to the student of physiology.

(3.) Let it be remembered when the following note is compared with (1) and (2), that (2) has been re-written by later curators of the Museum, and that is the reason why we do not find the antiquated expression "polypous excrescences." On the other hand, (1) and (3) having been written under Stanley's superintendence, there has been no corruption of text for the benefit of science in accordance with advanced ideas in pathology. Corruption of text, though one of the worst of literary sins, is often an absolute necessity in science; but in the present case we have more to do with literary than with scientific evidence.

From the MSS. "Reports of Cases in St. Bartholomew's Hospital,"
vol. v. p. 485.

"CASE XCVII.—(*No Name*), age 2.—*Disease*—Polypous excrescences growing from the mucous membrane of the bladder in a child. For several months the child had suffered from symptoms of stone in the bladder. I (Mr. Stanley) sounded it, but discovered no stone. The symptoms of irritation of the bladder continued, with no abatement, through the next month, then there occurred an extremely painful tension of the parietes of the abdomen, through the hypogastric region. When my attention was first directed to this condition of the abdomen, I thought its cause might be an over-distension of the bladder; accordingly, I introduced a catheter and found only a small quantity of urine in the bladder. The pain and tension of the walls of the abdomen were soon afterwards accompanied by a fluctuation just below the umbilicus. Accordingly, I here punctured the integuments, and from the opening

there issued first some fluid of the appearance of urine, then about two ounces of matter. From the opening urine continued to flow so freely, and in such quantity, that the whole of it took this course, none passing by the urethra. From the time the opening in the abdominal walls was made, the child gradually sank, and in a few weeks afterwards died.

“On examining the body after death, the bladder was found much hypertrophied in its muscular and mucous coats. Its cavity contracted, and more than half-filled by a mass of soft, polypous excrescences of the bulk of a walnut, this mass being made up of many pendulous projections from the mucous membrane of the bladder, especially around its neck. These projections were of a rounded figure, varying from half an inch to one inch and a half in length, and about the thickness of a quill. Their free surfaces were smooth, and apparently continuous with the mucous membrane of the bladder. The opening in the abdominal walls led to an abscess between the recti-muscles and the peritoneum. At the lowest point of this abscess the end of the urachus was seen projecting from the fundus of the bladder.

“The tube of the urachus was free to the bladder, but no passage could be clearly traced from the urachus through the coats of the bladder into its cavity. The right kidney was twice its natural size, with deposits apparently of urine in its interior. The left kidney was also hypertrophied, being about one-third larger than natural.”

“Mr. Stanley remarks, ‘There can be no question respecting the order of the phenomena in this case. The polypous growth in the bladder, especially around the neck, would obstruct the flow of urine into the urethra, and thus give rise to the symptoms of stone. The bladder thus rendered irritable, and called upon to make more than the usual efforts for the expulsion of urine, became hypertrophied. Then, as a further consequence of the obstruction to the exit of urine from the bladder, the urachus re-opened. The further explanation of the phenomena must be conjectured, with, however, but little doubt of their correctness, to the following effect—that the urachus re-opening, as it has done in other instances of obstruction, from any cause, to the exit of urine from the bladder, that thus becoming distended with urine, it (the urachus) had given way, permitting the escape of urine into the cellular tissue between the recti-muscles and the peritoneum, hence the formation of the abscess which I opened, and through which the urine passed to the opening in the parietes. The only difficulty or hitch in this explanation occurred in the not find-

ing the continuation of the tube of the urachus through the coats of the bladder into its cavity. Although great pains were taken to discover this channel, it could not be found. Still, however, I am convinced of its existence as the outlet of the urine from the bladder into the cavity of the abscess in the abdominal parietes, and thence through the outward opening just below the umbilicus. It should have been noted that the ureters were much dilated, but otherwise unaltered.'—Transcribed from Mr. Stanley's private notes.—*W. S. Kirkes.*"

(4.) But turning back to Savory, we find that in the written archives of the Abernethian Society his name alone is associated with the case. Thus manuscript and printed evidence are equally divided between the two great St. Bartholomew's surgeons.

From "Transactions of the Abernethian Society," Part I. vol. ii.

This is the report of a meeting of that Society, held on October 30, 1850, Mr. Luther Holden, President, in the chair. As Dr. Morley Fletcher pointed out to me, the date is five months later than that of the reading of Stanley's paper before the Pathological Society (May 6th).

"Mr. Savory related the particulars of a case of polypus of the bladder. The President observed that in the case here related there was no passage discovered between the bladder and the urachus, although urine had escaped during life from the umbilicus. The Secretary related the particulars of a similar case recorded by the late Mr. Crosse of Norwich."

A short but expressive note. Once more, in an original document, we find such a term as "polypus of the bladder." Observe that the age is only given in (1) and (3), both Stanley's reports.

There can be little doubt that specimen 2419 is from Stanley's case. There are a few discrepancies in the above reports, but they tend to show that (2) and (4) were less perfect clinical records, as there is no mention about suspicion of stone and sounding, as in (1) and (3). In (2) the patient is said to have died "some days" after the incision was made, but according to Stanley's report (3) he survived for "a few weeks;" most probably the error is in (2). In (2), however, as well as (1) and (3), it is recorded that there was a patulous urachus which opened into the abscess, so that urine entered it from the bladder, and that the urine escaped from the incision made

surgically at or near the umbilicus, and not, we may presume, before Stanley used the knife. In other words, the umbilical end of the urachus was not previously patulous. Mr. Holden's observation in (4) gives the reader an opposite impression, but most probably his remarks have been carelessly abbreviated, so that "after incision" should have followed the words "from the umbilicus." All the reports, however, agree that there were morbid growths in the bladder, and Stanley in (3) agrees with (2) and (4). Thus though urine flowed through the incision before death, no passage could be clearly traced from the patulous urachus through the coats of the bladder into its cavity. He does not, by the way, distinctly state this fact in (1), but (3) is evidently the fuller report. I shall dwell presently on this remarkable phenomenon, which has been observed more than once, and must be remembered when a true urachal cyst is treated by operation. The above discrepancies, I need only say at present, are insufficient to prove that the four documents do not refer to one and the same case. Two cases so very similar would hardly be seen within five months even in a great hospital. The specimen must have been exhibited by Savory at the Abernethian Society on Stanley's recommendation or permission.

A few remarks on diseases of the urachus in general may not be out of place.

The comparative anatomy and embryology of the urachus are well known. On the other hand, many statements relating to the anatomy of the human urachus have been taken too much upon trust. In the same manner urachal fistula has been well studied, and clinical records of that condition seem usually accurate, whilst the most extravagant legends (for they can hardly be called clinical histories) are extant in relation to urachal cysts.

THE URACHUS IN MAN.

The Sheath.—We were taught in Gray's "Anatomy" (5th edition), that the summit of the bladder "is connected to the umbilicus by a fibro-muscular cord, the urachus." Farther on we learn that the "urachus is the fibro-muscular cord already mentioned, extending between the summit of the bladder and the umbilicus. It is broad below at its attachment to the bladder, and becomes narrower as it ascends."

This teaching is not strictly accurate. Gray speaks of the sheath of the urachus as though it meant all that is understood by the word "urachus," and says nothing about its canal.

So we were taught thirty years ago. In the 14th edition of Gray's "Anatomy" I find the following paragraph on the subject:—

"The urachus is the obliterated remains of a tubular canal which exists in the embryo, and connects the cavity of the bladder with a membranous sac placed external to the abdomen, opposite the umbilicus, called the allantois. It passes upwards from the apex of the bladder between the transversalis fascia and peritoneum to the umbilicus, becoming thinner as it ascends. It is composed of fibrous tissue mixed with plain muscular fibres. On each side of it is placed a fibrous cord, the obliterated portion of the hypogastric artery, which, passing upwards from the side of the bladder, approaches the urachus above its summit. In the infant at birth, it is occasionally found pervious, so that the urine escapes at the umbilicus, and calculi have been found in its canal."

Here, as in earlier editions, the sheath is described as the canal. Luschka many years ago distinguished the canal as the essential part of the urachus. The expression "obliterated remains" is at variance with Wutz's careful researches, which seem to show that the canal is, as a rule, partially pervious. The allusion to the allantois is misleading, giving the idea that the urachus is something quite different from the allantois. At page 86, in the same edition, the relations are described correctly—"A portion of the allantoic vesicle within the body-cavity is eventually destined to form the bladder, while the remainder forms an impervious (?) cord, the urachus, stretching from the summit of the bladder to the umbilicus."

Nevertheless, the sheath is the most essential part of the urachus in the human adult. Its upper part is chiefly tendinous, its middle and lower third mainly muscular. The great majority of the muscular fibres, all of the plain variety, run vertically. Two microscopical drawings of the sheath of the urachus will be found in my contribution published in the eighty-first volume of the *Medico-Chirurgical Transactions*.

This fibro-muscular cord may, it seems, be the primary seat of a new growth. One very distinct case has been reported, but from some reason not very clear, it is usually classified with cysts of the urachus in text-books.

I will reproduce here the original report:—

"Dr. Aveling exhibited a sub-peritoneal tumour which grew in the anterior abdominal wall, and reached from two inches above the umbilicus to the pubes. It was removed post-mortem, the patient having died after an exploratory operation."¹

¹ *Brit. Gynæc. Journ.*, vol. ii. 1887, p. 56.

According to Mr. Bland Sutton's report,¹ this tumour weighed four pounds and three-quarters. It was multilocular, the outer part was made up of unstriped muscular fibres, the inner of spindle-cells, with loculi formed by mucoid degeneration. The tumour is figured. There is no report of its connection with the bladder, but Mr. Sutton informs me that it was certainly part of the urachus. In fact, there seems little doubt as to its origin and nature. It was a myo-sarcoma of the sheath of the urachus.

Thus, on the authority of Sutton, a myo-sarcoma of the sheath of the urachus has been observed. On the other hand, it is doubtful whether a myxo-sarcoma of the urachus has ever been seen. Specimen 417B in the Museum of the College of Surgeons shows a large myxo-fibroma (or myxo-sarcoma) attached to the apex of the bladder of a male child aged sixteen months. "The tumour," says the Catalogue, "probably originated from the urachus." Mr. Targett has, however, revised the Catalogue, and asks for the erasure of this sentence. He writes to me that the tumour "originated from the pericystic connective tissue, and happened to be at the apex of the bladder. There is not the slightest reason for attributing it to the urachus. No doubt that structure was destroyed by it. I have seen two other similarly placed sarcomata of the bladder in children, beside the cases given in my paper. Indeed, any part of the extra-peritoneal cellular tissue may become the seat of these soft myxo-sarcomata in children, and their relations to viscera are thus accidental."

The case in question was under the care of Dr. Lauder Brunton, and the necropsy was made by Dr. Leonard Guthrie, who informs me that the tumour "was seen to be connected with the upper part of an elongated but seemingly normal bladder. The remains of the right hypogastric artery coursed up the side of the bladder, and ended in the mass above." A short notice of this case will be found in Mr. Targett's monograph, "On Sarcomata of the Bladder and their Classification."²

The experience of so sound a pathologist as Mr. Targett must warn us against making too sure of the seat of origin of any large solid tumour in the region of the urachus. Mr. Sutton's myo-sarcoma, on the other hand, is very probably a tumour of authentic urachal origin.

The Canal of the Urachus—Wutz's Valve.—In 1883 a painstaking German anatomist examined seventy-four post-mortem subjects, and found that the canal of the urachus is, in part

¹ Brit. Gynæc. Journ., vol. ii. 1887, p. 187.

² Trans. Path. Soc., vol. xlvii. p. 311, second paragraph.

at least, constant, epithelial lining and all.¹ In twenty-four there were distinct cystic dilatations of the urachus, and in two of these cases the cysts had suppurated owing to septic disease elsewhere.

Wutz found that the tubular epithelial portion of the urachus normally continues growing up to about the twenty-fifth year, the canal becoming wider. It does not grow so fast as the adjacent structures, so that, as the subject grows older, its upper limit recedes from the direction of the umbilicus. The epithelium, irregular in form, is stratified below, but reduced to one layer above.² In the sub-epithelial connective tissue is, according to Wutz, a layer of plain muscle-cells. It is most probable that the muscular capsule of a urachal cyst is developed from this layer, rather than from the sheath.

The most important discovery for which we are indebted to Wutz is the existence of a transverse valvular fold at the vesical orifice of the urachal canal. It is of high pathological, clinical, and surgical importance, and deserves to be distinguished as Wutz's valve. The phenomenon of the escape of urine into the urachal canal, when there is obstruction to the exit of urine from the urethra, as in Stanley's case, the subject of this paper, seems to imply that there is such a valve, and that it can be forced. The same fact seems further established by the sudden escape of urine from a surgical incision made into a true cyst of the urachus, when at, and for some time after the operation there was no evidence of any urine entering the cyst.

I cannot say, however, that the anatomy of Wutz's valve has been satisfactorily determined. Ample material is at hand at St. Bartholomew's Hospital for thorough research into the anatomy of the human urachus. I should rejoice to study the record of good work done in such a field. At present, we must content ourselves by agreeing that a urachal canal may exist, and that something certainly prevents urine from entering that canal from the bladder, though occasionally it fails to do so. That Wutz is right in making out that that something is a valvular fold of mucous membrane there can be little doubt.³

¹ "Ueber Urachus und Urachus cysten," Virchow's Archiv, vol. xcii. 1883, p. 387.

² Want of space forbids me from dwelling on the epithelium of the urachus and its cysts.

³ "On inspecting the inner aspect of the vesical mucous membrane at the point where the urachus begins, it will be seen, in most cases, on stretching the tissues a little, that a funnel-shaped depression exists, at the apex of which is a narrow opening." In two of Wutz's seventy-four cases there was no opening; in twenty-one the orifice seemed closed, but a bristle could be passed from the urachus into the bladder. In fifty-one the bristle could be introduced through the opening in the vesical mucous membrane into the urachal canal; but even in these cases there was a certain resistance, as though there were a valve over the narrow opening, "which

Cannot that little be cleared away by our demonstrators, registrars, and pathologists?

The valve, or whatever it ought strictly to be called, explains how, in Stanley's case, "in consequence of the obstruction to the exit of urine from the bladder, the urachus re-opened." Stanley's experience is not unique.¹

Urachal Fistula, Complete and Incomplete.—The complete form includes all cases where the canal of the urachus is not only open throughout, but also opens into the bladder below, and on the skin of the umbilicus above. The incomplete form, where the umbilicus is not patulous, but the dilated canal opens into the bladder, includes Stanley's case. This variety is closely allied to another condition, true cyst of the urachus communicating with the bladder. The two conditions cannot always be distinguished, for leakage of urine may certainly dilate the urachal canal till it forms a true cyst, whilst a cyst may develop in the urachal canal, and afterwards communicate with the bladder.

The most typical example of complete urachal fistula is Paget of Worcester's "Case in which the Urachus remained open, and a ring-shaped Calculus, formed on a hair in the Bladder, was extracted through the Umbilicus."² Many other instances of complete fistula have been recorded.

Stanley's case is a good sample of the incomplete variety. The patient was very young, and it is just in such cases that we find evidence that the urine forced into the urachus from the bladder is the primary, direct, and indeed sole cause of the dilatation of the urachus.

Among the cases doubtful in the sense explained above, I may note George Morgan's, where the patient was a boy aged five, and David Newman's of Glasgow, where the patient was a man aged thirty-nine.³ In both cases the cyst was incised and drained, in both urine escaped for awhile from the incision, and in both the incision ultimately healed. Judging from the facts of each case, the cyst in the first instance was most probably developed through the entry of urine into the urachus abnormally patulous at its vesical extremity. This condition might explain the second, though it is also probable that a cyst developed in the urachus, and acquired a communication with the bladder

seemed to be formed by a transverse fold of the mucous membrane." Dr. Leonard Guthrie observed a "slight dimple or depression," indicating inside the bladder the site of a urachus otherwise obliterated (Case of Congenital Deficiency of the Abdominal Muscles, Trans. Path. Soc., vol. xlvii. p. 139).

¹ Here I must note that diverticula of the bladder near its apex must be distinguished from patulous urachus.

² Med. Chir. Trans., vol. xxxiii. 1850, p. 293.

³ Cyst of Urachus, Glasgow Med. Journ., vol. xlv. 1896, p. 20.

afterwards. Bryant records a very similar case in a man aged thirty-five.

Cystic Dilatations and Tumours of the Urachus.—There can be no doubt that urine may escape out of the umbilicus through a urachal fistula, and that if the umbilicus be closed, it may dilate the urachus into a cyst, as in the examples above discussed. There also can be no doubt that primary dilatations of the urachal canal are not rare, and that they may never communicate with the bladder, even when they develop into formidable cystic tumours.

Cystic dilatations are common in men, and have been seen in many mammals where the parts concerned are homologous to those in man, that is to say, where the segment of allantois included within the body of the embryo is differentiated into urachus and bladder. In the course of my own operative practice I have seen many such dilatations. As a rule, they are elongated and not very wide, representing a short track of unobliterated canal. Sometimes they appear as spherical cysts from the first, and, as Wutz has shown, several cysts may be found in the same urachus, looking like a row of beads. This accounts for the multilocular urachal cysts sometimes met with. In the case where I was the operator, the lower loculus was so well developed that I took it for the bladder, until the catheter was passed and found to lie completely behind and below the loculus.

There is, therefore, no difficulty in understanding how a cystic tumour of the urachus may develop. Wutz was sceptical about large tumours described as urachal being really developed from the urachus at all. Here he went rather too far; but it cannot be doubted that others have been much too credulous.

Wutz showed conclusively that Hoffmann's tumour, in which fifty litres of fluid were found after death, was not extra-peritoneal, whilst the urachus was quite separate from it. Two other cases described by Hoffmann were clearly not urachal cysts. Heinecke's "urachal cyst" was an encapsuled peritoneal exudation. Roser's case was very obscure, Wolff's cyst was preperitoneal, and enucleated from the hypogastrium and left iliac fossa of a woman. Most likely it was an ovarian or broad-ligament cyst which had burrowed under the peritoneum.

Wutz detected the errors in the statements of the above observers, who thought that the cysts which they described were urachal. Hence his scepticism. Yet he is often quoted at second-hand as though he believed that the cysts were

urachal. Even now the surgeon who opens an encysted dropsy, and fails to recognise the diseased, thickened parietal peritoneum, is too apt to think that he has incised a urachal cyst.

On the other hand, Tait, Ill, Douglas, Bryant, Rotter, and myself have operated on cysts where anatomical relations, and even more reliable evidence, have shown that they were in all probability of urachal origin. In some cases the urachal cyst has been enucleated from the parietal peritoneum, which invested the whole of its posterior aspect. In most, the relations to the bladder and to the peritoneum and viscera were evident. In several, as in my own, the wall of the cyst was found to contain a regular layer of plain muscular fibres belonging either to the sheath, or more likely to the sub-epithelial connective tissue of the urachus.

The nature of the remarkable cysts described by Lawson Tait in 1887 remains conjectural.¹ He found enormous collections of fluid invested by a wall "as thick as sole-leather" (Byron Robinson). This wall was said in some cases to invest the pelvic viscera and lower abdominal viscera in place of the peritoneum. He suggested a theory to explain this appearance, or rather his interpretation of this appearance. The allantois, he believes, remains entirely enclosed within the fœtus. The lower viscera push forward and make for themselves a serous investment of the allantois, so that there are allantoic broad ligaments and recto-uterine and utero-vesical pouches.

In the contribution to the "Medico-Chirurgical Transactions," to which I referred at the beginning of these notes, I entered into this remarkable subject at great length. I showed that Mr. Lawson Tait and Dr. Byron Robinson both admitted that this "allantoic cyst" doctrine was purely a theory which they had never proved by post-mortem evidence. I also showed that there were insuperable objections to the theory.

Thus the cyst-wall, "thick as sole-leather," which invested the pelvic viscera, was most likely peritoneum altered by tubercular disease. In operating upon patients afflicted with that malady, I have frequently seen a membrane "thick as sole-leather" occupying the site of the parietal and visceral peritoneum.

In fact, most of Mr. Tait's cases were examples, I suspect, of the ascitic type of tubercular peritonitis, or of encysted dropsy from some other form of peritonitis. The inflammatory

¹ See Tait, "Twelve Cases of Extra-Peritoneal Cysts," *British Gynæcological Journal*, vol. ii. 1887, p. 328; and Byron Robinson, "Cysts of Urachus," *Annals of Surgery*, vol. xiv. 1891, p. 337.

process had ceased, but the effusion for some reason was not absorbed. The after-histories of these cases are very defective. One or more were possibly urachal cysts developed from the urachus properly so called.

Mr. Tait was unable to be present and join in the discussion when the paper was read. In a letter written to me a month later he admitted that his theory was not proved, but insisted that my own theory was untenable. He remarked that I overlooked the fact that mature hair follicles were detected by the microscope in sections of the cyst-wall in one case. This I admit. But this fact suggests that the cyst was a universally adherent ovarian dermoid, or a dermoid tumour developed from some other abdominal organ. Bland Sutton detected fat like omentum in the contents of one of Tait's cysts. Free fat suggests dermoid cysts, whilst if it were really omentum the cavity must have been intraperitoneal, not the interior of a dilated urachus or allantois. Mr. Tait has recently operated on two or more similar cysts with excellent results. Here I must add that incision alone, or incision and drainage, cures the true urachal cyst, and very often, for reasons never made clear, cures cases of chronic tubercular peritonitis.¹ The effusion does not recur, and the uterus, previously fixed, soon becomes perfectly movable.

Surgical Treatment of Urachal Cysts.—In conclusion, let the surgeon when he comes upon a cystic tumour closely associated with the abdominal wall be sure of its relations. Parietal peritoneum may be so altered by chronic inflammation as to be easily mistaken for a cyst-wall. To take an encysted dropsy for a urachal cyst is not serious for the patient, as drainage cures both. On the other hand, whether a true urachal cyst be recognised or not, it is apt to degenerate into a urinary fistula, even when there is no communication with the bladder at the time of the operation. Hence the operator must be vigilant about after-treatment in cases where he opens or removes cysts closely related to the abdominal wall below the umbilicus. Ill, of Newark, New Jersey, describes a case where the surgeon overlooked this possibility. The patient came under Ill's care for a very bad urinary fistula.

When a urachal cyst is recognised and can be enucleated from the parietal peritoneum behind it, the detached serous membrane often requires trimming, as it is apt to slough. Care must be taken not to wound the bladder; sometimes a

¹ I find that it is best not to drain. In one case, where I operated and drained, there was discharge of cheesy material for months, though the patient got well at last. Without drainage convalescence is speedy.

portion of that organ has to be excised with the cyst. Rotter removed a tumour of the vesical mucous membrane together with a cyst of the urachus.

There was an instructive discussion on the treatment of the detached peritoneum at a meeting of the American Association of Obstetricians and Gynæcologists in 1897; it is published in that Association's Transactions, vol. x.¹ Dr. Vander Veer advocated bringing down the omentum and stitching it to the peritoneum, the vitality of the latter being thus ensured. Ill believes that enucleation of a urachal cyst from the peritoneum is dangerous even when feasible, and prefers incision and drainage, which answered very well in my own case. In one of his own patients there was a short track of patulous urachus between the cyst and the bladder. He wisely treated this track as though it were a vermiform appendix, cutting it very short, turning in the cut edges, and closing it with a Lembert suture. Simple ligature might have been followed by urinary fistula, as the ligatured mucous membrane would not have healed. Reed, of Cincinnati, was unable to enucleate a urachal cyst completely in two cases. He cut away much adherent peritoneum, and, to secure approximation of the edges, he separated the serous membrane for two inches behind the margin of the abdominal wound, and then made the edges meet without tension. He lays stress on uniting the peritoneum thoroughly, so that two broad surfaces of endothelium meet. This guards against urinary fistula. Macdonald, of Albany, and Cushing, of Boston, did not dread leaving the detached peritoneum. The same thing was done in nephrectomy and ligature of the common iliac artery. Douglas's case more probably died of sepsis from the fluid in the cyst than from sloughing of the peritoneum.

¹ This volume was published after the appearance of my memoir on a case of cyst of the urachus.

ON THE RESULTS OF OPERATIONS FOR CANCER OF THE BREAST.

BEING AN ACCOUNT OF 129 PATIENTS OPERATED ON
BY MR. BUTLIN BETWEEN THE YEARS 1880
AND 1895 INCLUSIVE.

BY

HENRY T. BUTLIN, F.R.C.S. ENG.

ASSISTED BY

J. PRESTON MAXWELL, F.R.C.S. ENG.

In the year 1887, when "The Operative Surgery of Malignant Disease" was published, I had not sufficient material of my own from which to draw results of any considerable value, and I was therefore obliged to analyse the statistics furnished by English and foreign surgeons, and to draw from them the conclusions which were expressed in the various chapters of the book. I ventured to express opinions on the subject of the operative treatment of cancer of the breast which differed in some important respects from the teaching of the more advanced surgeons at that time. My opinions have been quoted at intervals, and, worse, the opinions I was supposed to have held have been stated in books and papers, and I have been consequently spoken of as the advocate of partial operations.

In truth, in addition to the desire to exhibit as truthfully, and on as large a scale as possible, the results of operations for malignant disease in many parts of the body, the leading theme of the book was that the operation should be adapted to the nature and condition of the disease in each part of the body, so far as our knowledge would permit us to do so; and that the operation should not be dictated by theoretical considerations, unless these were founded on the most careful observa-

tion. I particularly combated the teaching of Mitchell Banks and S. W. Gross, who were accustomed to advocate the removal of the entire breast in every case of cancer, of all the integument over the breast, of the fascia over the muscle, and of the contents of the axilla, whether they appeared to be diseased or not. Banks certainly furnished far better results than any other surgeon at that period, so far as freedom from recurrence is concerned. For whereas the cures (on the three-years' limit) due to a large number of operations for mammary cancer were scarcely more than 10 per cent., Banks was able to boast 15 per cent., a very decided improvement. But as the mortality in his cases equalled about 12 per cent., I objected to his operation as needlessly large and dangerous. And I believed that equally good results might be procured with much less danger by the careful adaptation of the operation in each case to the disease, as I conceived it to be at that time.

My conception of cancer of the breast, as I knew it then, was that it consisted in an alteration in a certain part of the breast; that it spread locally from that part as from its centre, and always spread farther than the naked eye or touch could distinguish; that it affected the integument immediately over it, and again spread in all directions from that point; that some juice or material which could not be perceived was carried after a time to the lymphatic glands, and was capable of originating similar disease in the glands; but that the lymphatics between the primary disease and the glands were in most cases free from the disease, and that the glands might entirely escape infection if the disease was very slow in progress, or was removed at a sufficiently early period.

With this in mind, I recommended and carried out an operation in which the tumour became, as far as possible, the centre of the operation, without reference to the remainder of the breast. The disease and about an inch of the surrounding tissues in every direction were removed; the fascia beneath the tumour and a part of the muscle were taken away, if the disease had nearly approached the fascia; and the axilla was cleared out *only* if the glands were enlarged, or if there were suspicious fulness. I fully believed that such an operation would do quite as much for cancer of the breast as any larger operation which did not take the disease as its centre, and I felt equally sure that it would be far less dangerous.

For some years past I have been conscious that I have not reckoned up and published my results as I undoubtedly ought to have done; and I can only excuse this neglect on the plea of the large amount of work I have done, and the diffi-

culty of discovering the final results of operations practised years ago.

Several causes have at length combined to rouse me to the duty of giving an account of my work. First, the necessity of preparing a second edition of "The Operative Surgery of Malignant Disease," which very much requires to be brought up to the present date, both in the matter of material and of opinions. My own views have, naturally, been considerably modified during the last twelve years, and are often very different from those which are expressed in the first edition. Also, the necessity for defending myself against the charge of advocating partial operations, which has been interpreted "incomplete" operations; and the desire to give greater publicity in this country to what is called Halsted's operation, the extent and exact limit of which is still but imperfectly understood here. I am very pleased, too, to take the opportunity of criticising my own work, as I have criticised that of others, and to be able to acknowledge the errors into which I have fallen, and the means which I have since taken to repair them.

Even with the best intention, I should never have had the courage to attempt to discover the results of so large a number of cases in hospital and in private practice, beginning so far back as the year 1880, had I not found an admirable assistant in my former House-Surgeon, Mr. J. Preston Maxwell, to whom I cannot express my thanks too warmly. Those who have been accustomed to trace former patients will appreciate the thoroughness of his work when I say that he has traced ninety-six out of ninety-eight hospital patients, although only seventy-four of these are available for this paper, because the total number contains several cases in which the first operation was not performed by me, and a far greater number who have been operated on since the end of 1895. My reason for only carrying the inquiry up to the end of 1895 is that every patient will, by the time this paper is published, be qualified for consideration on the three-years' limit, which we are all agreed should elapse before she should be claimed to have been cured. For my own sake, I should like to have carried the cases up to the end of 1897, but I am sure it is better that it should close with the cases treated up to the end of 1895, for the reason I have stated. My private cases I have looked up with such success that I have traced all but one of them. Altogether there are 129 different patients available for this paper, and only three of them are at present untraced. Of the time, trouble, and expense of such an inquiry only those can judge who have made a determined effort to discover the further history of their patients. As I

regard such inquiries as very important for the future of the operative surgery of cancer, it may not be out of place if I state shortly the means through which they are successfully conducted.

The Hospital patients are first collected from the operating-theatre book, in which each surgeon signs his name against the operation he has performed. The full name and address of each patient is then obtained from the admission books in the Steward's office. Every case is carefully looked up in the Registrar's notes, and an abstract of each is taken, showing the duration of the disease before operation, the seat and size and associations of the tumour, the extent and nature of the operation, and the immediate results. In a few instances these notes contain an addendum of the further history of the patient, who may have presented herself at the Hospital for advice or further treatment, and the case may be thus completed. But such good fortune is rare. The actual work of discovery now begins. A letter is written to every patient, asking her to come to the Hospital on a certain day, and a small sum is promised as an inducement. This has resulted in bringing a really large number of patients up for inspection, and I have been able to exhibit as many as ten or twelve to my class in one day. If the letter is disregarded, and is not returned through the Dead Letter Office, a second letter is written or a domiciliary visit is paid. Some patients are thus discovered. But if the patient is not discovered, or the letter is returned, the next step is a visit to Somerset House (a suggestion for which we are indebted to Mr. Christopher Heath, at the somewhat unfortunate discussion at the Royal Medical and Chirurgical Society, in the course of last winter). The death records are carefully searched, at the rate of a shilling for each individual. A great many of the missing names are found there; and very often the certificate contains sufficient information to permit the case to be completed. If it does not, the doctor who signed it is communicated with, and necessary details are thus procured. The residue of undiscovered cases forms the greatest difficulty of all. The patient is, presumably, not dead—unless she has married since the operation and changed her name, which happens now and again. Every such patient requires to be sought out by such measures as Mr. Maxwell is a master of: letters to friends and neighbours, visits, letters to doctors, journeys into the country, &c., &c. All this needs great tact and patience. But these are the very cases worth the searching for; the large majority of them go to swell the successful list. The only patients Mr. Maxwell has failed to trace are a woman

who was operated on in 1882, whose name and person have disappeared completely, and who has not been found in the death records; and a woman who was treated in 1893, and whom he still expects to find, for there is every reason to believe she is not only alive but is working as a servant.

The Private patients, up to a certain point, are comparatively easy to trace, for the medical man who has attended or sent up the case affords all the necessary information; but beyond that point, they are even more difficult to find than those who have been in the Hospital. In our private case-books we seldom set down the Christian name of the patient, especially if she is married, and the address is sometimes merely a temporary address. If the medical man does not respond to the first and second letter, it is very difficult to obtain a reply. Nor can the patient be directly written to in most cases, for obvious reasons. However, I have managed to obtain the further history of fifty-three out of fifty-four cases available for this inquiry, and I still hope I may hear of the remaining lady, though I am not very sanguine of doing so. I should like to take this opportunity of publicly thanking all the medical men who have so kindly responded to me or to Mr. Maxwell on these cases, and to say that I should never have summoned up the courage to ask them had I not been so strongly impressed with the value which these completed series of operation cases will have on the future of the operative surgery of malignant disease.

DIVISION OF THE SUBJECT.

Mr. Maxwell, in working up the statistics of my Hospital cases, divided them into several groups; and the division which he made appeared to me to be very well adapted to the consideration of the whole series of cases.

Group I.—Removal of a portion of the breast, either with or without removal of glands.

Group II.—Removal of the breast (only).

Group III.—Removal of the breast and axillary glands.

Group IV.—Halsted's operation.

It is probable, from later investigations on the anatomy and extent of the mammary gland, that the distinction between many of the cases in the first group and those of the third group is to a great extent artificial. With the most determined intention to the contrary, it seems almost certain that even large operations have left behind fragments of mammary

gland. However, it seems well to preserve the distinction between the first and third groups, because, in the first group, there is no question that a part of the mammary gland was deliberately left behind.

GROUP I.—*Removal of a Portion of the Breast, either with or without removal of the Axillary Glands.*

Total number of cases 23

In eighteen of the twenty-three cases the glands were removed from the axilla. In most of them the operation was performed for the removal of disease of limited extent situated in the far upper or lower part or in the outer part of the breast. But in several of them it was thus performed owing to uncertainty of the nature of the disease, which was only found to be cancerous after it had been removed.

The results may be thus tabulated:—

Died of the operation	2
Dead or alive with local recurrence	9
Died of cancer without local recurrence	5
Not yet traced	1
Alive and well	6
<hr/>	
Total	23

The mortality is singularly large from the operation itself, but it is really accidental. In a paper on the year's surgery in a former volume of the St. Bartholomew's Reports, I gave an account of the death of an old woman from repeated small doses of morphia and opium on the night of the operation, and the other patient died of acute mania more than two months after the removal of the disease, when she was well of the operation itself. But as the attack of mania had occurred while she was still under treatment for her wound, it would be unreasonable not to attribute the death to the operation.

Unfortunately, it has not been possible to discover the exact seat of the local recurrence in the unsuccessful cases, or even whether it took place in the region of the breast or in the axilla. Only the fact of recurrence *in situ* can be declared.

The six cured patients were alive and well at various periods from three to more than ten years after the operation. As these have to be compared with a total of twenty-two, the untraced case being eliminated from the inquiry in accordance with the rule I have always followed in treating the statistics of operations, the proportion is about 27 per cent.

GROUP II.—*Removal of the Breast (only).*

This group contains ten cases, with the following results :—

Died of local recurrence	3
Died of cancer without local recurrence	1
Alive and well	6
<hr/>	
Total	10

The proportion of cured cases therefore reaches the astonishing figure of 60 per cent. The explanation may be found in the character of the disease removed, which was, in several of them, that variety of cancer of the breast which we now recognise as duct-carcinoma. Three of the six cured cases were of this variety, which is obstinate, with a great tendency to recur *in situ* if the entire breast is not removed, but which runs a slow course, and rarely affects the lymphatic glands until it has existed for a very long period. It does, however, affect the glands in the same manner as the ordinary varieties of carcinoma of the breast. I have known it do so in three instances. The first was the case of an old woman, on whom I operated many years ago at the Hospital on several occasions for a primary tumour of a kind I had never to my knowledge seen before, and for recurrent growths. Her case was read at the Pathological Society.¹ But two years after the case was read she returned to the Hospital with a small recurrence of the disease, and with several enlarged and hard glands in the axilla. She would not submit to an operation for their removal. That the glands in such cases contain a precisely similar disease to the primary tumour I have been able to assure myself on two occasions. I removed the breast and glands of a lady between forty and fifty years of age for a small tumour which was adherent to the nipple and adjacent skin, and was associated with enlarged and hard glands in the axilla. It proved on microscopical examination to be a duct-carcinoma, and the structure of the glands was precisely similar to that of the tumour of the breast. The case is included in the next group, and falls among the successful cases.

The other case was also that of a lady, who consulted me in 1890 for a tumour of the upper and inner part of the breast, about the size of a broad fig. I removed the breast, and found that the tumour was a duct-carcinoma. She returned to me in 1892 with two little nodules towards the axilla, and a number

¹ Vol. xxxviii. p. 343.

of small but hard glands in the axilla. I freely removed the tumours and the contents of the axilla, the glands of which contained typical duct-carcinoma. This lady figures as one of the successful cases, for she remains well now, six years after the second operation.

In the other remaining successful cases the structure of the disease was that of the ordinary tuberos carcinoma.

GROUP III., *in which the Breast and Lymphatic Glands were removed, consists of 83 cases.*

The operation was not performed on any typical design, but was adapted, as far as possible, to the apparent requirements of the case. It was, in every instance, very free, including a large area of the integument, the centre of which corresponded to the centre of the growth. In almost every case the fascia over the pectoral muscle was removed to about the same extent as the integument; and if the tumour approached the pectoral fascia, a part of the thickness of the greater pectoral muscle was also taken away. The removal of the contents of the axilla was performed in the old-fashioned method, rather by scooping them out than by dissection. And although the tissues lying between the primary disease and the glands were not methodically or always removed, they were often in great part removed; but the breast and the contents of the axilla were not removed in one continuous mass.

The tabular statement of the results is:—

Died of the operation	4
Not yet traced	2
Dead or alive with local recurrence	39
Dead of cancer without local recurrence	16
Dead of other cause within three years of operation	2
Dead of other cause more than three years after operation	3
Alive and well	17
Total	83

Taking first the deaths due to the operation, they are thus accounted for. One patient died of acute tetanus (in 1883), and one of bronchitis three weeks after the operation (in 1881). I was not attending her at that time, and her medical man told me her death was due to careless exposure during the dressing of the wound one cold morning. One lady who was very stout

and very unhealthy complained of rheumatic pain in the back several days after the operation. The nurse, without asking permission or mentioning it, applied a strong mustard poultice between the shoulders. Ulceration was caused by the mustard; an attack of erysipelas occurred around the ulceration, and of that she died. And the fourth patient died of sepsis after the removal of an ulcerated carcinoma.

Five patients have died since the operation, two within a few months, of accident and pneumonia; three, from $3\frac{1}{2}$ to 13 years, of morbus cordis and old age and exhaustion. These three will therefore be included in the list of successful cases.

The number actually alive and well at the present time is 17, which, with the three cases just mentioned, makes a total of 20 successful cases, with periods of $3\frac{1}{2}$ to 14 years since the operation. As two of the 83 patients have not been traced, and two of them died of other disease than cancer within three years of the operation, the total number of cases with which these 20 have to be compared is 79, so that the percentage of cures is fully 25 per cent.

COMPLETE RESULTS OF THE FIRST THREE GROUPS.

Before proceeding to consider the Halsted operation, I propose to sum up the results of the operations which were performed on the lines laid down many years ago, when my conception of the anatomy and pathology of the disease was in several respects very imperfect.

The total number of cases is 116, made up of 23 in the first group, 10 in the second group, and 83 in the third group. In table the results appear as follow:—

Died of the operation	6
Not yet traced	3
Dead or alive with local recurrence	51
Dead of cancer without local recurrence	22
Dead of other cause within three years of operation	2
Dead of other cause more than three years after operation	3
Alive and well	29
Total	116

The mortality due to the operation itself has been as nearly as possible 5 per cent., which will not appear large when it is remembered that the mortality in 600 cases under the care of

various surgeons, and published in my book in 1887, was very nearly 16 per cent. At the time of writing, I judged that mortality to be unreasonable, and ventured to express the opinion that a 5 per cent. mortality would be attained in future. From now, however, I trust the mortality will be smaller, although, with large operations performed on women often in poor condition and of advancing age, I doubt whether it is likely to be less than 3 per cent. A large operation for removal of the breast and contents of the axilla is not in any respects less, and is often more severe, than amputation through the thigh as high up as the junction of the middle and upper thirds, and usually a good deal more blood is lost. It therefore cannot be expected that hundreds of such operations should be performed without an appreciable mortality.

The number of cases in which the disease recurred *in situ* is very large, not far from 50 per cent., for the 51 cases must be compared, not with the total of 116, but with 116 less three patients not yet traced and two patients who died of other cause than cancer within a year of the operation—in fact, with 111 patients. I have included among the recurrences *in situ* those cases in which the disease recurred not only in the region of the breast and the axilla, but those in which it affected the supra-clavicular glands, or produced thickening of the sternum; but I have not included those in which it attacked the other breast, unless there was also recurrence in the parts on the same side as that on which the operation was performed.

The number of patients who died of cancer in the other breast or in some other part of the body, the liver, femur, spine, &c., is also considerable, amounting to not far from 20 per cent.

In spite of this, the results, so far as cured cases are concerned, are extraordinarily good. They consist of 29 patients alive and well, and three patients who died of other causes than cancer more than three years after the operation, altogether 32 successful cases. Comparing this with the total of 111 cases, the proportion amounts to as nearly as possible 29 per cent. The various collections of cases referred to in my book gave only a percentage of about ten cures to 100 patients, but Mr. Mitchell Banks had improved that for his own cases up to about 15 or 18 per cent. The present statistics, therefore, compare favourably with any statistics of operations for cancer of the breast extending over a similar period, whether the mortality due to the operation or the successful cases are considered.

The duration of cure in the 32 cases is as follows:—

From	3	to	4	years	.	.	.	.	.	2
"	4	"	5	"	.	.	.	.	.	10
"	5	"	6	"	.	.	.	.	.	3
"	6	"	7	"	.	.	.	.	.	8
"	7	"	8	"	.	.	.	.	.	0
"	8	"	9	"	.	.	.	.	.	1
"	9	"	10	"	.	.	.	.	.	2
"	10	"	11	"	.	.	.	.	.	2
"	13	"	14	"	.	.	.	.	.	2
"	14	"	15	"	.	.	.	.	.	2
										—
Total										32

The small number of patients well between three and four years after the operation will be accounted for when I come to speak of the Halsted operations which I began to practise four years ago.

Of course, I cannot claim that a microscopical examination was made of the disease in every instance. I did it for my private cases, and it was done for a good many of the Hospital cases; fortunately, for some of the most successful of them. But in that respect my cases are on a par with those from which my tables and statistics were taken a dozen years ago.

Again, there was no attempt to select cases for operation in order to make good statistics. It has been the custom of the surgical staff of my Hospital to operate in every instance in which it has appeared likely that the patient would receive even temporary benefit from the operation. I have adhered to this principle throughout, both in private and in public practice. In many of the unsuccessful cases the operation was only undertaken as a palliative measure; enlarged glands above the clavicle and outlying nodules of cancer of the integument were left behind, and the breast was removed to relieve the distress occasioned by its weight or ulceration.

Until the last few weeks, I had no idea how my cases would exhibit when they came to be collected and analysed; and I confess I am greatly relieved that the results are so satisfactory; for I should have been profoundly distressed if I had discovered that operations practised on the lines I had strongly urged had proved less successful than operations on lines of which I could not then approve.

LATER RESEARCHES ON THE ANATOMY AND PATHOLOGY
OF CANCER OF THE BREAST.

My attitude in regard to operations for cancer of the breast remained much the same until the year 1894, with the exception that I grew more in the habit of removing the axillary contents as a routine proceeding, whether they were in a suspicious condition or not. The small mortality from the larger operation in the later years of the eighties and the earlier years of the nineties seemed to me to justify it as a precautionary measure.

But towards the end of 1894 I happened on Professor Halsted's paper on the "Results of Operations for the Cure of Cancer of the Breast," &c., in the twentieth volume of the *Annals of Surgery*. He had taken for the scientific basis of his operations the investigations of Heidenhain on "The Causes of Local Recurrence of Cancer after Amputation of the Breast," which were published in the thirty-ninth volume of *Langenbeck's Archives* (1889). I had overlooked this paper, and, owing to the many claims upon my time, had not studied thoroughly another paper on the "Surgical Anatomy of the Breast and Axillary Lymphatic Glands," reprinted from the *Edinburgh Medical Journal* (1892), which the author, Mr. Harold Stiles, had been so good as to send me.

Halsted's results appeared to me good enough to justify a thorough reconsideration of the subject, although they had been published too soon after the performance of most of the operations to allow of a fair estimate of their value. I therefore set to work to study Heidenhain's paper, and later that of Stiles, in order to see how far the operation fulfilled the pathological requirements of the disease. I need not do more than give a short summary of the investigations. Heidenhain came to the conclusion that every mammary gland in which a nodule of cancer exists is in very wide extent, probably *in toto*, diseased, and that epithelial cells are carried away over wide areas in the lymph vessels of the mamma; that the cancer rapidly extends backwards towards and into the pectoral fascia, even when there appears to the naked eye to be a wide interval between the edge of the tumour and the fascia; and that the fascia adherent to the muscle and passing in between its fibres is almost impossible to remove without taking away a part at least of the thickness of the muscle. The pectoral fascia is very rich in lymphatics, which are early occupied by metastases of the cancer. Finally, Heidenhain agreed on the whole with

the description of the lymphatic system of the breast by Langhans, who found that the lymphatics of the mamma are quite separate from those of the overlying skin, except where the two systems communicate through the great lymphatic plexus beneath the areola, which receives all the lymph from the breast below and from the skin above. From this plexus it is conveyed to the inferior axillary glands through two large afferent vessels.

Stiles differed in one or two respects from Heidenhain. Both investigators were agreed in their view of the difficulty of removing the entire mammary gland by the ordinary method of operating, especially in thin women, and Stiles drew out a very different scheme of the anatomy of the breast from that which formerly existed. But Stiles did not share the view of Heidenhain on the general disease of a large part or the whole of the glandular tissue of the breast in every case of cancer. On the other hand, he fully concurred with Heidenhain in believing that cancer-cells are soon and widely conveyed through the lymphatics of the breast, and particularly towards the pectoral fascia. The scheme of the lymphatics of the breast drawn up by Stiles, again, differed in very important respects from that of Langhans, for he discovered lymphatics containing cancerous emboli (1) in the connective tissue processes radiating from the tumour into the surrounding breast tissue or circum-mammary fat; (2) in the breast tissue remote from, as well as close to, the tumour; (3) in the connective tissue septa separating the lobules of the circum-mammary fat; (4) in the so-called "ligaments of Cooper," where they often lead to small disseminated cancerous nodules in the corium; (5) in the retro-mammary tissue and pectoral fascia. Stiles also made a very important observation to the effect that "Occasionally the glands above the pectoralis minor, in the apex of the axilla and under the clavicle, are diseased, while the pectoral glands are normal. This points to the probability that some of the lymphatics from the mamma pass to join the glands at the upper part of the axilla directly, without entering the pectoral group."

I have never been in the habit of allowing myself to be rashly led into the performance of extensive operations which are based solely on theoretical considerations, even when supported by microscopical investigations, unless the theory was also supported to a reasonable extent by clinical observations. When, then, I had read the papers of Heidenhain and Stiles, I began to consider how far their investigations accorded with what I had actually seen in practice. In spite of the wide area of apparently healthy tissues I had removed, in almost all cases,

around the actual tumour, the number of cases in which there was recurrence in the breast region (not the axilla) was remarkable. Certainly many of them were due to affection of the integument, which was already present before the operation. But some were in the tissues beneath the skin, and I quickly called to mind several cases in which the recurrent tumour had been in the muscle. For instance, in 1891 I removed the breast of a lady for a small tumour immediately beneath the nipple, which was much retracted. I made a note at the time to say that it was very movable over the pectoral muscle. The fascia was roughly cleared off the face of the pectoral, but none of the muscle was removed. In 1894 I removed a small recurrence from the substance of the pectoral muscle some distance beneath the middle of the scar; and again in 1896 I removed a similar small recurrence from the substance of the pectoral muscle.

In 1894 I removed the breast and contents of the axilla for a lady who was suffering from a tumour of the outer segment adherent to the integument. It was well above the pectoral muscle, and I only cleared the fascia roughly off. Exactly a year later I removed two little tumours from the substance of the pectoral muscle. There was no other recurrence, and the scar was perfectly sound. These cases made a great impression on me at the time, and I did not know how to explain what had occurred.

Again, I remembered cases in which the lower axillary glands, and even those higher up beneath the muscle, were but little diseased, while those in the space above the lesser pectoral muscle were larger and more obviously cancerous.

Plaques and nodules in the skin generally appeared to me to acknowledge the tumour rather than the nipple as their centre, and I have in some of my successful cases left the nipple and areola for the sake of preserving skin in cases in which a very wide area had been removed over and around the tumour.

I could not say from my experience whether recurrence ever took place in the connective tissues between the breast and the axillary glands, but my impression was that it did not do so. My experience led me to believe that Heidenhain and Stiles were correct in thinking that cancer of the breast often extends much farther backward than its appearance would betoken, and that the fascia and muscle may be already affected by a cancer at some distance in front of the fascia; to agree with Stiles in believing that there is a system of lymphatic vessels in the lines of Cooper's (suspensory) ligaments, and that the disease may make its way directly through the glands beneath the clavicle

without necessarily passing through the lower axillary glands. In respect to the infection of the skin through the medium of the lymphatic vessels, I thought the clinical evidence went to show that it occurs as a rule through the lymphatics of the integument immediately over the tumour rather than by the roundabout course of the infra-areolar plexus.

I therefore came to the conclusion that a few more patients in every hundred, perhaps more than a few, might be saved by a more complete removal of the mammary gland, a free removal of the whole thickness of the pectoral muscle beneath the disease, and by a more systematic and careful dissection of the axilla.

HALSTED'S OPERATION.

Halsted's operation, although perhaps more sweeping than is absolutely needful, appeared to me to answer better to these indications than any other; and, since the beginning of 1895, I have made it my routine operation, although I did not dare, especially at first, to perform it in every case in private and public practice. It aims at removing the diseased tissues, the contents of the axilla as high as the clavicle, and the intervening tissues in one continuous mass. It includes the removal of the whole of the pectoral muscle, or all of it with the exception of the clavicular portion, and the removal of the fascia beneath it, and of that in front of and behind the lesser pectoral muscle, which is divided in order to enable the axilla to be more thoroughly cleaned out. I prefer, if possible, to describe an operation as nearly as I can in the words of the author. In doing so now, I shall omit the theoretical considerations with which the description is interspersed.

(i.) The skin incision is carried at once and everywhere through the fat.

(ii.) The triangular flap of skin (with its point towards the clavicle) is reflected back to its base line (at the posterior fold of the axilla). There is nothing but skin in this flap. The fat which lined it is dissected back to the lower edge of the pectoralis major muscle where it is continuous with the fat of the axilla (Fig. 7).

(iii.) The costal insertions of the pectoralis major are severed, and the splitting of the muscle, usually between its clavicular and costal portions, is begun, and continued to a point about opposite the scalenus tubercle on the clavicle.

(iv.) At this point the clavicular portion of the pectoralis major muscle and the skin overlying it are cut through hard up to the clavicle. This cut exposes the apex of the axilla.

(v.) The loose tissue under the clavicular portion (the portion usually left behind) of the pectoralis major is carefully dissected from this muscle as the latter is drawn upward by a broad sharp retractor.

(vi.) The splitting of the muscle is continued out to the humerus, and the part of the muscle to be removed is now cut through close to its humeral attachment.

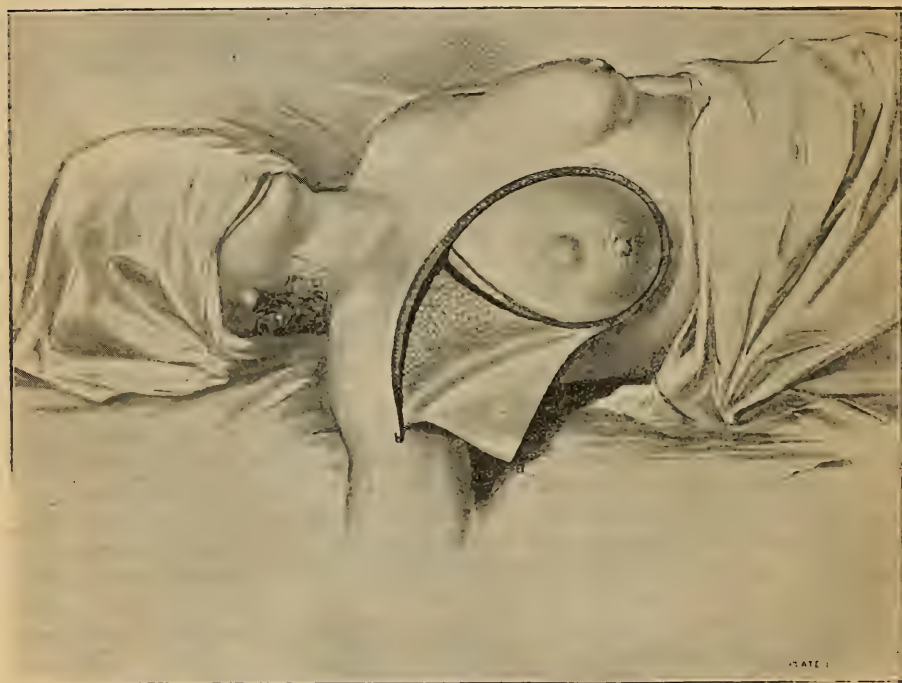


FIG. 7.—Halsted's Operation for Carcinoma of the Breast: the First Incision.

(vii.) The whole mass, skin, breast, areolar tissue (muscle), and fat, circumscribed by the original skin incision, is raised up with some force, to put the sub-muscular fascia on the stretch as it is stripped from the thorax close to the ribs and pectoralis minor muscle. It is well to include the delicate sheath of the minor muscle when this is practicable (Fig. 8).

(viii.) The lower outer border of the minor muscle having been passed and clearly exposed, this muscle is divided at right angles to its fibres, and at a point a little below its middle.

(ix.) The tissue over the minor muscle near its coracoid insertion is divided as far out as possible, and then reflected inward in order to liberate or prepare for the reflection upward of this part of the minor muscle.

(x.) The upper outer portion of the minor muscle is drawn upward with a broad sharp retractor.

(xi.) The small blood-vessels under the minor muscle near

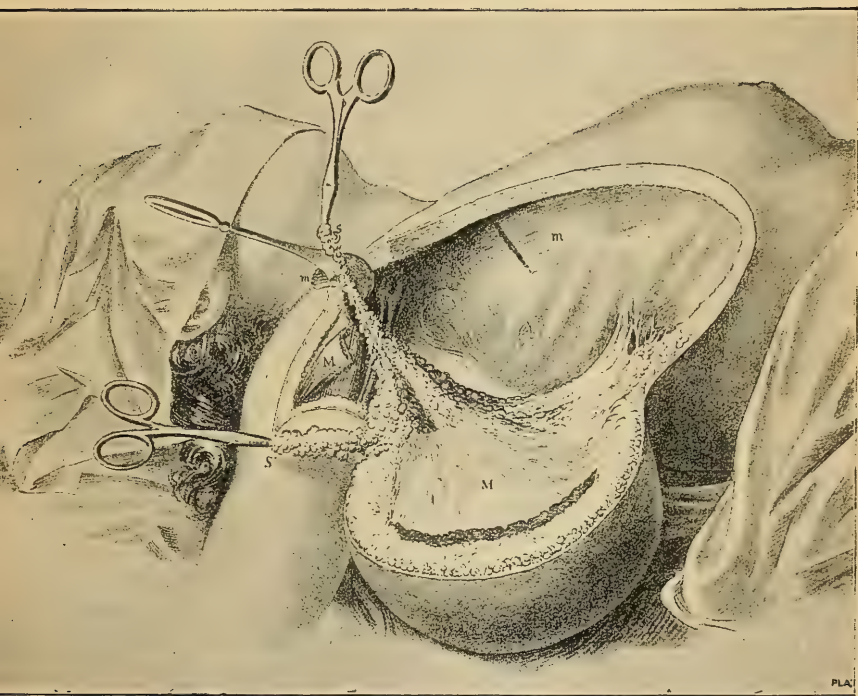


FIG. 8.—Halsted's Operation for Carcinoma of the Breast: the mass turned down.

its insertion must be separated from the muscle with the greatest care. These blood-vessels should be dissected out very clean, and immediately ligated close to the axillary vein.

(xii.) Having exposed the sub-clavian vein at the highest possible sub-clavicular point, the contents of the axilla are dissected away with scrupulous care, also with the sharpest possible knife. The glands and fat should not be pulled out with the fingers.

(xiii.) Having cleaned the vessels, we may proceed more

rapidly to strip the axillary contents from the inner wall of the axilla,—the lateral wall of the thorax. We must grasp the mass to be removed firmly with the left hand, and pull it outward and slightly upward with sufficient force to put on stretch the delicate fascia which still binds it to the chest. This fascia is cut away close to the ribs and serratus magnus muscle.

(xiv.) When we have reached the junction of the posterior and lateral walls of the axilla, or a little sooner, an assistant takes hold of the triangular flap of skin and draws it outward, to assist in spreading out the tissues which lie on the sub-scapularis, teres major, and latissimus dorsi muscles. The operator, having taken a different hold of the tumour, cleans from within outward the posterior wall of the axilla. Proceeding in this way, we make easy and bloodless a part of the operation which used to be troublesome and bloody. The sub-scapular vessels become nicely exposed and caught before they are divided. The sub-scapular nerves may or may not be removed, at the discretion of the operator.

(xv.) Having passed (or cut through) these nerves, the operator has only to turn the mass back in its normal position, and to sever its connection with the body of the patient by a stroke of the knife.

This operation appears to me to offer advantages which are not rendered by any of the operations which we have been in the habit of practising in this country. I think it exposes the axilla up to the clavicle far better than the proceeding described by Mr. Watson Cheyne in his excellent Lettsomian Lectures at the Medical Society in 1896 ("The Objects and Limits of Operations for Cancer"), and it is not more severe. Two objections have been urged against it by some of my colleagues. First, that it is very dangerous to life; second, that the movements of the upper extremity are likely to be greatly crippled by the wholesale removal of the muscle.

To the first of these objections I would reply, that between the beginning of 1895 and the end of 1897 I performed the operation thirty-three times, and that only one of the patients died. I suppose that death must be attributed to shock. The patient died twenty-four hours after the operation. It was one of the early series, and I think I was perhaps not so careful in arresting hæmorrhage from the intercostal vessels (in cutting through the muscle) as I have been since. On the other hand, I cannot say that I regard the operation as comparatively trivial. It is a very large operation, and should be performed with great care, and not too fast, so that the vessels are taken up, as far as possible, before they are divided.

So far from the movement of the arm being seriously restricted, I have been surprised to find that it is, as a rule,



FIG. 9. — Photograph of a patient to show the range of movement of which the arm is capable after removal of the breast by Halsted's method.

better than when the muscle is left behind (Fig. 9). It depends

almost entirely on the amount and piece of skin which is removed. In closing the wound, the greatest care should be taken to supply a very good covering of skin to the axilla. If there is no subsequent tension there, the arm can be freely moved.

Of the thirty-three cases only thirteen are available for this inquiry, for the remainder were treated after the end of 1895. They tabulate thus:—

Died of the operation	1
Dead or living with local recurrence	2
Dead of cancer without local recurrence	1
Alive and well	9
<hr/>	
Total	13

Of these patients eleven were treated in the Hospital. They were not in any way selected, but were accepted whether they were good or bad cases for operation. The disease was examined microscopically in every instance, and the report is furnished by the Pathological Department. In one case the tumour proved to be a duct-carcinoma; but in the other ten it belonged to the usual variety of hard or spheroidal-celled carcinoma. In more than one of the successful cases the glands also contained cancer. My House-Surgeons have been very interested in these patients, and we see some of them from time to time. For the purpose of this inquiry Mr. Maxwell was good enough to bring nearly every one of the successful cases to the Hospital, where I was able to show them to my class.

Of course, this is a very fortunate series of cases, and I do not expect that the next or many future series of thirteen will yield nearly such good results. For the successful cases are in the proportion of nearly 70 per cent., which we are not likely to reach for the present.

I have not removed the supra-clavicular glands in any of my cases, and I am disposed to think, with Cheyne, that cases in which these glands are affected are hopeless. But I am not yet prepared to speak definitely on this matter.

WHAT MAY BE HOPED FROM OPERATION IN THE FUTURE.

The study of the later results of operations for cancer of the breast holds out hope of great improvement in the future. Of course I am not so sanguine as to believe that every case of cancer of the breast will by-and-by be successfully treated by operation. There are many cases in which the disease is so malignant and runs so rapid a course that no operation

will avail against it. And there are cases in which the patient is quite unconscious of being the subject of cancer until the disease is advanced. In these and similar circumstances operation will be but palliative.

But two things lead me to hope much better things from operation than it has hitherto accomplished. First, the results which have been achieved during the last few years. Add to my own cases those of Cheyne and Halsted, taking only those in which the operation was performed at least three years ago. By a singular chance Halsted's results are the least satisfactory of the three. Out of his fifty cases of operation only eleven occurred more than three years before the publication of his paper, and as one of the eleven was lost sight of as soon as she left the hospital, only ten are available for use. Two of these ten patients died of unknown cause about three years after the operation, but as that cause may have been cancer they cannot be claimed to have been cured. They should therefore be regarded as belonging to the class of untraced cases. Of the remaining eight patients, two were alive and well more than three years after the operation. The total number of patients operated on by the three operators, either by Halsted's method or by the large method which Watson Cheyne has employed, is forty-two, each one of whom has been traced more than three years after the operation. Of these, twenty-three were alive and well or had died of some other cause than cancer after the three-years' limit.

Second, these results have been procured under very disheartening conditions. Instead of obtaining the cases early for operation, there is scarcely one in which the disease was not known to have existed several months, and there are many in which it had existed for one, two, three or more years. There were many in which the axilla was full of cancerous glands, and several in which the primary tumour was ulcerated. In making up my statistics of operations on the tongue, I separated the private from the hospital cases, because I was anxious to discover how far the earlier treatment of the disease, which was general in the private cases, affected the mortality due to the operation, and the prospect of cure of the disease. I thought I would do the same thing for my cases of cancer of the breast. But I found there would be little use in doing so. The results are very much the same in public and in private; for the good reason that the cases when they come under treatment are in much the same condition, both in regard to the stage of the disease in the breast and neighbouring parts and the general health of the patient.

At first I was astonished to find that the private patients deferred the question of an operation for so long a period; but, as I think of it, I am sure the cause is not of one kind, but of several. Cancer of the breast is very often discovered by chance, and neither the patient nor the doctor can believe that the little painless thickening is really the beginning of cancer. How can I doubt this when medical men bring their wives and female relatives to me with cancer of the breast and glands, which they have been "watching" for many months, or more than a year!

The patients have only a feeble hope that they can be cured by an operation, or even that they can be protected from recurrence for many years. How can we wonder at this, when it is the view of a vast number of the medical practitioners in this country, and when the prevailing sentiment of several of the most experienced surgeons in London, expressed in the debate on Mr. Sheild's paper at the Royal Medical and Chirurgical Society last session, was that operation for cancer of the breast is but palliative, at the best. Once cancer, always cancer! If after the operation a woman does not die of cancer of the breast, she will certainly do so of cancer of some other part of the body.

I trust this paper may do something to correct the evil and unfortunate impression which such a sentiment is certain to produce, and that it may lead medical men, and through them their patients, to seek the benefit of early, not late, operations, in the full hope that at least half of the patients suffering from cancer of the breast may thus be cured by operation.

ON THE
CASES OF APPENDICITIS UNDER THE CARE
OF MR. BUTLIN

DURING THE TWO YEARS FROM OCTOBER 1896 TO
SEPTEMBER 30, 1898, INCLUSIVE.

BY

A. R. J. DOUGLAS, M.B., B.S.,
WITH A NOTE BY MR. BUTLIN.

When so much is being written and so much attention is being directed to the subject of the operative treatment of appendicitis, it seems a suitable time for a review of some of the cases of appendicitis operated on recently in this Hospital. This short article is directed to a commentary on two years' operative treatment of appendicitis in this Hospital by Mr. Butlin, viz., from October 1896 to October 1898.

The total number of patients operated on in the two years was twenty-nine. Some of these patients were operated on more than once (*e.g.* some patients at a first operation had an abscess opened and drained, without any attempt to find or remove the appendix, which was removed at a subsequent operation).

During the first year (October 1896 to October 1897) the total number operated on was ten, an average of rather less than one a month during the whole year. During the second year the total was nineteen, nearly double the number operated on during the preceding year. For the purposes of classification the cases are divided into three groups, adopting Mr. Berry's method for indexing the Hospital cases:—

- (1.) Recurrent appendicitis (non-suppurative).
- (2.) Chronic appendicitis, with abscess.
- (3.) Acute appendicitis, with suppuration.

I.—RECURRENT APPENDICITIS (ten cases, all recovered).

During the two years operations were performed on ten cases of recurrent appendicitis. Of these, all but two (*i.e.* eight) were operated on during the last year, that is, the year ending September 30, 1898.

- 1 patient had had three or four attacks every year since 1891, the cause of his pain not having been previously diagnosed.
- 1 had had four attacks.
- 3 had had three attacks.
- 3 had had two attacks.
- 1 had had several attacks.
- 1 case gave no history of a previous attack.

 10

In each case an incision was made over McBurney's point, the appendix removed, and the abdominal wall sewn up in separate layers. In one case the presence of pus was suspected; an incision was made, but no pus was found. The appendix was not sought for on account of the condition of the parts. A drainage tube was inserted for a few days, and the patient made a good recovery. One other case was of special interest. This patient had a large cavity at the apex of his left lung. On opening the abdomen by the usual incision, small hard nodules were found in the omentum, which were thought to be tuberculous at the time of the operation. On microscopical examination afterwards, no definite opinion was arrived at. Only the stump of the appendix was found, about $\frac{3}{4}$ inch long. This was removed close to the cæcum. The abdomen was closed in separate layers; the wound healed by first intention, and the patient left the Hospital twenty-five days from the date of operation. He had had four attacks of appendicitis. With the exception of one case in which a complication arose, and the case that was drained, the patients left the Hospital quite healed and well just over three weeks from the time of the operation (*i.e.* from twenty-two to twenty-four days).

The case in which a complication arose was not a simple recurrent case of appendicitis, as the boy had had a chronic appendix abscess opened by Mr. Lockwood for Sir Thomas Smith about four months previously in Henry Ward, and about $\frac{1}{2}$ oz. of pus let out. The patient had not had any further trouble till just before admission, when he had another attack. Mr. Butlin found the appendix constricted in the middle,

removed it, and closed up the abdomen in separate layers. No drainage tube was inserted, and no pus was found at the time of the operation. The patient went on well for eight days, then his temperature and pulse gradually rose, and soon there was distinct evidence of suppuration, pus beginning to point in the old scar. The abscess was opened, and foul-smelling pus mixed with blood-clot let out. He then made a rapid recovery. The abscess in this case might perhaps be compared to a "residual abscess." The patient left the Hospital thirty days from the date of the first operation. Stress has been laid on the fact that the abdominal wound was in each case sewn up in separate layers to try and obviate the risk of hernia, which may of course occur in the scar as in an ordinary laparotomy. I have seen in the Surgery at this Hospital a bad case of hernia in the scar of a patient operated on for appendicitis previously, but not at this Hospital.

II.—CHRONIC APPENDICITIS WITH ABSCESS (eight cases, all recovered).

Next, considering the cases of chronic appendicitis with abscess. During the first year there were two, and during the second year six patients operated on. In seven of the eight the abscess was opened and drained; no attempt was made to find or remove the appendix. In the eighth the appendix was removed at the time of operation. One patient returned some months later and the appendix was then removed.

All the cases recovered.

On examining the time the patients stayed in Hospital after the operation, it is found that—

2 patients left the Hospital 4 weeks after the operation.

2	"	"	5	"	"
1	"	"	6	"	"
1	"	"	10	"	"
1	"	"	13	"	"

One patient is still in the ward at the end of eight weeks with a large mass of indurated tissue in which two foci of suppuration have been opened on different occasions, each containing about 1 oz. of pus. This shows that five of the eight patients left the Hospital from four to six weeks after the operation. This includes one patient with an abscess out of which three to four pints of pus were let out, and another having about 16 oz. of pus. So that in these two cases at least, contrary to what one

would expect, the large size of the abscess did not cause the patient to remain longer in Hospital than the average time.

Of the remaining three cases, one patient was in for thirteen weeks, but he had signs of extensive tubercle in the lungs. The pus of the abscess was examined repeatedly for tubercle bacilli with a negative result.

Another patient was in Hospital ten weeks. At the operation an incision was made over the swelling, but no pus could be found. Another unsuccessful attempt to find pus was made three days later. (There were very strong indications that pus was present.) Nine days after this the abscess burst into the wound and discharged into the dressings; the patient's temperature then came down, and he made an uninterrupted recovery. Possibly if the incisions had not been made the abscess would have opened into the general peritoneal cavity, and caused the death of the patient from peritonitis.

The third case is that of a patient who has been in the ward for eight weeks since the first operation, and is still in at the present time. She was transferred from Hope Ward (September 26, 1898), where she was under the care of Dr. Hensley, with a large mass reaching to about an inch above the umbilicus. She had noticed this swelling since August 22. She was admitted to Hope, September 11. At one point in the upper part of the mass it felt softer on palpation. Mr. Butlin made an incision over this spot, and let out an ounce of pus. About seven weeks afterwards another incision was made, and the same quantity of pus was evacuated. The size of the mass remains about the same.¹

In the patient whose appendix was removed, the appendix was found hanging over the pelvic brim, the end of it lying in a small localised collection of pus in the recto-vesical pouch. The position of the appendix was diagnosed before operation by the tenderness and swelling felt on the right side of the rectum on making an examination.

Five cases were operated upon on the day of admission to Mr. Butlin's wards, two the day after admission, and one, who was believed to be suffering from a simple recurrent attack of appendicitis without suppuration, was kept in bed for a week before operation. (He had had several attacks previously; his temperature on admission was 90.2° and pulse 88.) So that the cases in which pus was believed to be present were all operated on as soon as possible, the majority on the day of admission.

¹ Since writing this, the pus has been examined and the mycelium of actinomyces found in it.

Another question of interest in connection with these cases is the length of time the patients had passed between the onset of the attack and the opening of the abscess.

1 patient was operated upon on the 35th day.			
1	"	"	30th "
1	"	"	14th "
2	"	"	12th "
1	"	"	11th "
1	"	"	9th "
1	"	"	5th "
<hr/>			
8			

Again, as regards the incision, if the abscess was close to the surface, almost pointing, as in some of the cases mentioned above, Mr. Butlin opened the abscess over the most prominent spot. If merely a mass of indurated tissue was felt, and the abscess cavity had to be searched for, the incision was made about an inch to the inner side of the anterior superior spine, so as to minimise the risk of passing through healthy peritoneum in reaching the abscess. In one case where, after the first incision, pus was not found, a second was made nearer the middle line, and the abscess cavity again searched for.

As regards the treatment of the cavity, in several of the cases the abscess was very chronic, and the cavity well shut off. These were treated by irrigation. In others, where the adhesions were not very firm, or in which, as in one case, the pus was only kept shut off by the descending colon and omentum, the cavity was carefully sponged clear of pus and a drainage tube inserted, no irrigation being used.

All the patients in this group did well, and left the Hospital for the time being cured as regards the abscess, although their appendix not having been removed, they are still liable to a fresh attack.

As we have seen above, only one was operated on during the first week of the attack, and some not for two, three, or four weeks. This was only because the patients were not seen till late in the illness. They all, however, did well, so that this seems to be an argument in favour of not operating at an early date, but rather of allowing time for the formation of firm adhesions and for the abscess to be well shut off from the general peritoneal cavity.

Of course beyond a certain time not only is nothing further to be gained by allowing the case to remain untreated, but it becomes harmful and dangerous to the patient. The great

extension of the inflammatory induration, or the large size of the abscess cavity, causing necessarily a long and tedious convalescence. This is seen in one or two of the cases quoted above.

III.—ACUTE APPENDICITIS WITH SUPPURATION (11 cases, 6 recovered, 5 died).

Lastly, considering the cases of acute appendicitis with suppuration. In all there were eleven operated on during the two years. In the first year there were six and in the second year five, so that this division differs from the other two in that there were fewer cases in the second year than in the first.

The acute cases might be subdivided into two classes, which tend to blend with each other. Firstly, those in which the general peritoneal cavity is infected from the beginning of the attack. This is illustrated by the case of a boy who died of acute septic peritonitis arising from his appendix. He was seen about twelve hours from the onset of the attack (judging by the history), and at the time of admission had septic peritonitis. He was operated on at once, but died soon after. These are the so-called "fulminating cases." And secondly, those cases with very acute symptoms, in which the patient is desperately ill, giving rise to a suspicion of general infection of the peritoneum, but in which at the operation slight connecting adhesions are found localising the inflammatory process.

Four of the eleven patients were suffering from general peritonitis when they were admitted into the Hospital. In another case general peritonitis occurred suddenly some days after the opening and draining of an abscess, which made its way, nevertheless, into the peritoneum. And in another case, it is a little uncertain whether general peritonitis was present when the boy was admitted, or whether it commenced on the following day. Four of these patients died, and two of them recovered after opening and draining the abdomen and removing the appendix.

So that out of six cases of undoubted general septic peritonitis secondary to inflammation of the appendix, two recovered, that is to say, the high figure of $33\frac{1}{3}$ per cent. of recoveries was obtained. This is most encouraging, considering the desperate nature of these cases, and the hopeless view which there is a tendency to take of them.

On account of the comparative rarity of recoveries from acute general septic peritonitis, and the scepticism which is

naturally exhibited as to the description of the patient's condition being correct, these two cases are quoted at some length.

CASE I.—A. J. T., æt. 13, schoolboy.

History.—For three weeks before admission there had been pain felt on and off in the right iliac fossa with nausea but no vomiting. Constipation for the same time. About three days before admission the pain became more severe. On the day of admission he vomited several times, and complained of pain and tenderness all over the abdomen.

Condition on admission.—Abdomen motionless, slightly distended, intensely tender; more tenderness and fulness in the right iliac fossa than elsewhere. Temperature 100.8° . Pulse 120. Respiration 30 per minute. Patient acutely ill.

Patient was operated on the same night about two hours after admission.

Operation.—A nearly vertical incision, about 3 inches long, made in the linea semilunaris in the right iliac region. On opening the general peritoneal cavity, it was found to contain *free pus*, of which there was also a collection in the recto-vesical pouch. The coils of intestine adjoining the cæcum were covered with a layer of lymph, and there were no adhesions, but a few coils were stuck together by lymph. Pus very offensive. The appendix being brought up into the wound, was found to be perforated at the distal end, swollen and thickened at the proximal. It was ligatured and removed. The abdominal cavity was then flushed out thoroughly with boracic lotion, gr. x. ad \bar{z} i., at a temperature of 105° – 106° , for some time. The upper part of the wound was then closed, a glass drainage tube inserted into the lower part of the wound, passing down into the recto-vesical pouch, and a Keith's dressing applied.

The patient seemed in fair condition. Temperature 97.4° , pulse 110. He was very restless, and was kept fully under the influence of morphia. He vomited on and off all the next day. His temperature remained low and he was delirious, shouting and swearing frequently. He was fed by nutrient enemata and dressed every four hours.

His condition remained very much the same till the *fifth day* after the operation, with the exception of the vomiting, which had gradually decreased. He was now decidedly better, with fewer attacks of pain and less restlessness. The glass tube was removed and an india-rubber one inserted. The recto-vesical pouch washed out with 1–6000 perchloride of mercury. Slight movement of the abdomen. The nutrient enemata were

stopped and a soap-and-water enema given. Wound irrigated three times daily at first, but after a day or two only once a day. Drainage tube finally removed twenty-five days after the operation. Patient went to the Swanley Convalescent Home thirty-nine days after the operation with the wound almost healed, and without any discharge.

This patient undoubtedly had general septic peritonitis. It is difficult to say when this became general, but probably, from the history, not till shortly before admission, possibly when the vomiting began. Here the cavity was irrigated with boracic lotion at a temperature of 105° to 106° , and the infective organisms must have been on the surface of the peritoneum, so that the mechanical effect of irrigation was sufficient to get rid of them, or at least so to diminish their numbers as to enable the peritoneum to deal with the remainder.

CASE II.—J. M. D., æt. 14, schoolboy.

History of one previous attack in the summer of 1896.

Two days before admission played football, afterwards ate three apples with their skins.

The day before admission, early in the morning, woke up with abdominal pain. Bowels open before breakfast. Got up, but had to go to bed again. Collapse, vomiting, and severe pain supervened. Temperature 98.4° , pulse 128.

Abdomen tender, legs drawn up. Given opium; had a fair night, with less pain and no vomiting. On the morning of admission vomited twice.

He was admitted under Dr. Church, who called in Mr. Butlin at 3 P.M. His general condition then was good. He lay on his back complaining but little, with his abdomen moderately distended and tender, especially on the left side. No definite tumour felt. There was no distress or collapse. At 10 P.M. he was worse, his abdomen not moving at all, legs slightly drawn up, expression anxious.

He was then operated on. The abdomen was prepared under the anæsthetic, and a vertical 3-inch incision was made, crossing a line joining the anterior superior spine to the umbilicus, about midway between these two points. When the abdomen was opened, pus was at once found free in the abdominal cavity. No limitation by adhesion of intestine. About 1 oz. of pus let out. The appendix was found perforated and containing two concretions; it was removed. The abdomen was then flushed out with 1-4000 biniodide of mercury, followed by boracic lotion for fully ten minutes, and a glass drainage tube with Keith's dressing inserted.

After the operation the temperature was 98°, the pulse 140, respiration 34 per minute. He was rather restless, but passed a fair night, being dressed once in the night, when slight abdominal movement was noted.

The day after the operation he was dressed about every four hours; as he vomited several times, he was fed by nutrient enemata. Altogether he was slightly worse.

He continued to vomit slightly till noon of the fifth day after the operation, but his pulse steadily improved, and its rapidity diminished.

On the seventh day his bowels were open once.

On the eighth day a smaller tube was inserted.

On the tenth day the drainage cavity was gently irrigated.

On the twenty-sixth day the wound was quite healed.

On the thirty-second day the patient was discharged quite well. Since then he has been seen at intervals, looking quite well and fat.

This case differs from the last as regards treatment, in that mercuric biniodide was used, 1-4000, in addition to boracic lotion. Possibly the result would have been the same if only boracic lotion had been used.

Let us consider the four cases that died of septic peritonitis.

I. The first patient, male, æt. 19, who died from septic peritonitis, came, in point of time, directly after the first case quoted above. The usual incision was made for the removal of the appendix, and some turbid, foul-smelling pus welled up. A glass drainage tube was passed into the recto-vesical pouch, and immediately several ounces of foul-smelling pus welled up through the tube. No search was made for the appendix. The patient died a few hours afterwards. The reason nothing further was done was that he was moribund on admission. The patient had only been ill for a few days.

A post-mortem examination was refused, but the wound was examined after death. It was found that there were no obvious adhesions at the seat of operation. The fluid let out first most probably came from the general peritoneal cavity; the second came from a deeper and partially shut off collection, probably in or near the pelvis.

II. The second patient, a boy, gave a history of six days' duration from the commencement of the illness. An operation was performed on the day of admission, and pus let out from a localised abscess cavity, which was irrigated with 1-500 biniodide of mercury and then with boracic lotion, and a drainage tube inserted. Patient did well till the fourteenth

day after the operation. In the early morning he had a good deal of pain. Mr. Butlin removed the tube, let out about an ounce of pus, and replaced the tube. Later on he showed signs of general septic peritonitis. He was seen in consultation with Mr. Willett and Mr. Cripps, and his abdomen opened in the middle line; he was then found to have general septic peritonitis. The peritoneal cavity was washed out, but he died soon afterwards.

Post-mortem examination.—General peritonitis. On the outer side of the cæcum was an abscess cavity, in which lay the appendix. It had burst into the general peritoneal cavity.

III. The third fatal case was that of a boy 4 years old, who was only taken ill with pain in the abdomen two days before admission. He was operated on immediately after admission.

As soon as the peritoneum was opened a sero-purulent fluid escaped. A director was passed to the outer side of the ascending colon, and pus welled up. An india-rubber tube was inserted. There were no signs of adhesions when the peritoneal cavity was opened. The patient did not show much improvement after the operation, and during the next day and night his condition remained very much what it was immediately after the operation, but on the whole there was a slight change for the worse. On the second day after the operation he was decidedly worse, and Mr. Butlin decided to open his abdomen. He was found to have general septic peritonitis. He was irrigated with 1-4000 biniodide of mercury and a glass tube inserted. Patient died a few hours afterwards.

Post-mortem.—Peritoneum in lower two-thirds of abdomen congested, and surface covered with fibrinous lymph by which coils of intestine adhered. Behind the ascending colon and hepatic flexure of the colon was a small retro-peritoneal collection of pus (1 oz.) lying in front of the right kidney and running up to the right lobe of the liver.

Possibly this patient had general septic peritonitis when he was operated on first. The case illustrated the great difficulty there is of deciding whether suppuration is limited to the appendix region, or whether the condition has become general. Apparently in some cases only great experience and a careful consideration of the intensity of the symptoms of peritonitis will enable a correct diagnosis to be arrived at. In this particular case there was very little doubt at the time of the second operation. Mr. Butlin covered up the first wound, and the skin having been carefully prepared in the middle line, made a second incision, so that if there had been healthy

peritoneum it would not have been infected. This is a useful proceeding for diagnostic purposes in certain doubtful cases.

IV. The fourth and last fatal case from septic peritonitis was of a child æt. 4, admitted on the fourth day of his illness. When the abdomen was opened in the appendix region, a sero-purulent fluid escaped. The appendix was found to be gangrenous and was removed. A second incision was made in the middle line, general peritonitis was discovered, and the peritoneal cavity and intestines carefully sponged. The patient died about six hours afterwards.

Post-mortem.—Many coils of intestines were found glued together by thick lymph. There was a little free fluid and some adhesions between the cæcum and the abdominal walls. Near the cæcum there were some caseous glands.

The other fatal case was found post-mortem to be due to intestinal obstruction. An incision was made in the appendix region and the general peritoneal cavity opened. A director was passed 6 inches downwards and inwards, and almost an ounce of pus evacuated. A soft rubber tube was inserted. The patient, in spite of all efforts, continued to vomit after the operation, and died the same night.

Post-mortem.—There was no general peritonitis, no free gas or fæcal extravasation. The whole of the pelvis was shut off from the general peritoneal cavity. The vermiform appendix was found lying over the brim of the pelvis, about 4 inches long; the last 2 inches sloughing. It contained two concretions. The intestines were matted together in the pelvis and deeply congested. The wound was above the area of the abscess, and death probably resulted from obstruction.

In this case, even if the exact condition had been known at the time of the operation, it is extremely doubtful whether any satisfactory operation could have been done for the relief of the patient.

This patient's history was, that for four days before admission he began to vomit, his bowels being open that day. Three days before admission he had passed flatus, and two days before admission he had been seized with severe abdominal pain. The pain and vomiting continued until the time of admission. On admission, temp. 99.6°, pulse 132.

Taking the six cases that recovered, two, as above mentioned, had general infection of the peritoneum; in the other four the inflammation had not become general; the area of suppuration in some of the cases was only shut off from the general cavity by the intestines and omentum being glued together by lymph. These were treated by an incision over the

appendix region about one inch from the anterior superior spine, a tube being inserted with as little disturbance of the parts as possible. Moreover, the general peritoneal cavity was only shut off from an abscess on the outer side of the cæcum by the great omentum being adherent. The abscess cavity was gently swabbed out and a tube inserted. Patient did well.

NOTE BY MR. BUTLIN.

I am very much indebted to my former House-Surgeon, Mr. Douglas, for the care he has taken in collecting and analysing the foregoing cases, and for his thoughtful commentary on them.

The surgery of appendicitis has been very much before my mind during the last three or four years; hence perhaps, in part, the large number of cases which have been under my care in the Hospital during the two years under consideration. Their number, and the variety of conditions which were presented, have enabled me to formulate my ideas on certain difficult questions far better than I could have done three years ago. I will, therefore, add to Mr. Douglas's commentary a short note on each of the three groups in which he has marshalled his material.

RECURRENT APPENDICITIS.

Two or three more cases would be included under this heading if it were possible to count the same patient more than once; for the appendix was removed in two or three patients who had been previously, or still were in the Hospital on account of acute suppurative appendicitis. The quiescent period was selected for the operation, in accordance with the rule which has become very general in this country.

The surest way of finding the appendix.—In most cases there is no difficulty in discovering and removing the appendix, but there are cases in which great difficulty is experienced; and I have heard of more than one instance in which the appendix has not been discovered, and the attempt to remove it has been abandoned. I think the safest way is to find the cæcum, and to work round it from the outer side (of course not forgetting the extremity, from which the appendix may extend directly downwards). If this is done methodically, it is difficult to understand how the appendix can be overlooked, even if it

is bound up in a mass of adhesions on the under aspect of the cæcum.

How to deal with an abscess around the appendix.—In separating the appendix from the surrounding structures during the quiescent period, and even very long after an acute attack of inflammation, an abscess is sometimes opened, and the pus may escape into the cavity of the abdomen, and cause fatal peritonitis, unless the operator has taken precautions against such a catastrophe. In cases in which there is reason to fear this complication, the opening in the abdominal wall should be enlarged, so that the parts may be thoroughly under control. The field of immediate manipulation should be protected by a sponge on either side. And if the appendix is sought for from the outer side of the cæcum, the intestine acts as a barrier against the entrance of pus into the general cavity of the peritoneum. I believe it is dangerous to irrigate in these cases. The abscess cavity should be sponged out, or carefully wiped out with pads of gauze, until it is quite cleansed from pus, and should then be drained for a few days. Irrigation is very likely to carry some of the contents of the cavity into other parts of the abdomen.

CHRONIC APPENDICITIS.

Mr. Douglas has raised the question of the proper period at which to search for pus in these cases. My own feeling is that if pus is present, the sooner it is let out the better for the patient, both on account of diminishing the danger of bursting into the cavity of the peritoneum, and of shortening the period of treatment. In cases of this class, in which there is strong reason to suspect the presence of pus, therefore, I do not hesitate to search for the abscess, beginning at the outer side of the cæcum, and working towards the middle line, in order to avoid opening the peritoneum. It may be necessary to operate more than once, and to make more than one incision, if the search is not successful on the first occasion. But I do not hesitate to do so, as I think that it is a better course than to wait until the pus approaches the surface, and can be readily discovered.

ACUTE APPENDICITIS.

The dangerous character of acute appendicitis is singularly illustrated by the eleven cases which came under my care. Four of the patients were actually suffering from general peri-

tonitis when they were admitted to the Hospital, two of them moribund, so that they died within a few hours of their entrance. They naturally suggest the question—

In what cases and at what moment should the surgeon interfere?—I believe the best rule is to operate without delay in those cases in which the attack is very violent, and rather suggests an attack of general peritonitis than one of appendicitis. I have more than once found pus within thirty hours of the commencement of an attack; and the pus was not enclosed at the back of the abdomen in the neighbourhood of the appendix, but escaped as soon as the anterior wall of the abdomen was incised. In less violent and rapid cases, it is generally safe to wait for two or three days. If, then, the temperature does not subside, and the symptoms are not decidedly relieved by rest in bed and low diet, an incision should be made, preferably over McBurney's point. If the pus is not in the general cavity of the abdomen, the operation should be very delicately performed, and should be limited to opening the cavity in which it is enclosed and inserting a drainage tube. And this should be done with the greatest caution not to break down the loose adhesions between the coils of intestine. Irrigation should not be employed.

Diagnosis of general peritonitis from severe appendicitis.—In some cases in which it is clear that appendicitis exists, the question arises whether the general cavity of the peritoneum is already involved; and it may be exceedingly difficult to decide between the graver and less grave condition. Yet the prospect of successful treatment must depend on very early appreciation of the occurrence of general peritonitis. Increasing rapidity of the pulse, and impaired mobility of the whole of the abdominal wall, point decidedly to general peritonitis. In such cases, an early operation for the appendicitis alone is strongly indicated. I have for some time past made it a rule, in case of doubt, to make a small opening in the middle line, or even on the left side of the abdomen, in order to decide the question of general peritonitis before opening in the region of the appendix. If no peritonitis is found, the opening is carefully closed, layer by layer, and the suitable operation for appendicitis is performed.

Question of irrigation.—I have already said that I am not in favour of irrigating even the abscess cavity in cases of acute appendicitis with suppuration, from the fear of breaking down adhesions and distributing the contents of the abscess in the cavity of the peritoneum. But when peritonitis has already taken place, the conditions are different. I have laid down

a kind of rule for myself, in such cases, to irrigate with boracic lotion and sterilised water when the peritonitis has extended almost all over the abdomen. But when the peritonitis is still limited to the lower part of the abdomen, and all the upper part is still free from inflammation, to sponge and cleanse, and not to irrigate.

ON PNEUMONIA AND THE PNEUMOCOCCUS,¹

WITH ESPECIAL REFERENCE TO THE
ACTION OF OXYGEN.

BY

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PRELIMINARY OBSERVATIONS.

By "pneumonia," in this connection, I mean the "acute lobar" or "acute croupous" affection, and by the "pneumococcus" the organism known under the many and various names of *Diplococcus pneumoniae* (Fränkel, Weichselbaum), *Diplococcus lanceolatus* (Foà, Bordoni-Uffreduzzi), *Micrococcus pasteurii* (Sternberg), Sternberg's micrococcus, *Streptococcus lanceolatus pasteurii*, *Streptococcus lanceolatus* (Gamaleia), and the micrococcus of sputum septicæmia.

This pneumococcus is a small organism about 1μ in length, and in breadth somewhat less. When obtained from the body, it is somewhat lanceolate in shape and encapsuled, there being usually two organisms in each capsule; but when obtained from cultures, the capsule is absent, and the organism is spherical or oval, and occurs singly, or in pairs, or in chains. It stains easily with the ordinary aniline stains, the capsule usually, but not always, remaining unstained; I have found the latter beautifully stained by eosin (in 50 per cent. alcohol), if very slightly washed afterwards. The organism retains the stain in Gram's method.

Having thus defined the terms of the first part of the title of this paper, I propose to give, first, a summary of some of the principal accounts published by workers in this field, and then to relate my own observations as to the action of oxygen.

¹ The Luke Armstrong Prize Essay. Published by permission.

A.—OCCURRENCE OF THE PNEUMOCOCCUS IN THE HUMAN SUBJECT.

According to the classical observations of Weichselbaum,^{1*} this organism was found in 94 out of 129 cases of mixed pneumonias, and this observer's authority is given by Carl Fränkel² for the statement that it is present in 90 per cent. of all cases of true croupous pneumonia. And C. Fränkel² makes the further criticism, that, with regard to the remaining 10 per cent. in which it was not *found*, "it must be remembered that the organism is very difficult to cultivate, and that the only certain method, *i.e.* the inoculation of agar plates, has not always been adopted by observers; and, secondly, that the *period of illness* at which the experiment is made is very important, inasmuch as, according to Weichselbaum and Monti, the earlier and the fresher the disease process, the more of the diplococci are present, and the later the fewer." It may be added to this that a method still more certain than the use of agar plates would be to inject the sputa (whenever the pneumococci were not found microscopically) of a series of cases of pneumonia into mice, when, if the pneumococci were present, septicæmia would be caused and the typical capsulated organisms discovered in the blood.

Out of 27 cases of pleuro-pneumonia, Monti³ found the pneumococcus present alone in 15 cases, with the staphylococcus in 3 more, and with the streptococcus in another one.

Gamaleia⁴ states that he found the pneumococcus in 12 fatal cases, and Dr. Goldenberg in 40 successive cases.

Another and potent argument for the connection between the pneumococcus and pneumonia lies in the fact that, in some cases, serum from convalescent patients has had the power of protecting rabbits against inoculation. Now such protection, according to our present knowledge, is always *specific* to the *one organism*; this subject will be further considered under the heading of "Immunity."

C. Fränkel² also gives the following list of authorities for the presence of the pneumococcus in cases other than acute lobar pneumonia:—

Nearly always in acute cerebro-spinal meningitis (Foà and Bordoni-Uffreduzzi).

Some cases of pleuritis (Fränkel).

" " " peritonitis (Weichselbaum).

" " " pericarditis (Banti).

" " " endocarditis and otitis media.

* The figures in the text refer to the "References" on page 106.

And says that, according to Netter, it is nearly always ("fast regelmässiger Bewohner") an inhabitant of the secretions of the mouth and nose.

A. Fränkel⁵ also says that the organism is found in 90 per cent. of the cases of pneumonia, and mentions Klein's⁶ cases of septicæmia produced in rabbits by the injection of saliva, at the same time remarking that the two kinds of bacteria described by Klein were, he thinks, one and the same. A. Fränkel also found that the sputum of pneumonics was three times as fatal to rabbits as that of healthy individuals.

Dr. West⁷ also brings forward statistics to show that the pneumococcus is very frequently present in broncho-pneumonia; out of 118 cases collected, the pneumococcus was actually found in 67.

B.—CULTURE CHARACTERISTICS.

These vary considerably according to the medium on which the cultivations are grown and the surrounding influences. So far as the atmosphere is concerned, the pneumococcus is classed⁸ with the facultative anærobes.

I will consider various media in order.

Eyre and Washbourn⁹ strongly recommend *agar-agar covered with a thin film of rabbits' blood* as the best medium, and say that on it growths retain their virulence for as long as sixty-six days, if the tubes are kept from drying and are kept at 37°. When kept at 20° or at 6°, they lose their vitality in twenty-one days.

(These last two statements are at variance with those of Kruse and Pansini,¹⁰ who stated that the drying of sputa or of cultivations did not damage the pneumococci, and that, if cultivations—on agar—were kept more than twenty-four hours in the warm incubator, they died the sooner.)

The bacterium also grows most excellently, and with varying appearances, in many cases on "*serum-agar*," i.e. agar-agar made up with ascitic fluid. In a series of sub-cultivations from the same original stock the following were examples of the varying appearances presented:—

I ₅	(8 days in warm incubator)	)	Isolated, tiny, clear colonies.
O ₄	(1 day " " " )	)	A film of small colonies, larger at the edge.
K ₇	(13 days " " " )	)	Isolated, large, clear colonies.
N ₄	(6 days " " " )	)	Flattened, whitish colonies, almost pearly in appearance, the largest of which were about 0.1 to 0.15 cm. in diameter.

On *gelatine*, tiny, transparent, discrete colonies are formed, not liquefying the medium, and very much like the colonies of *streptococcus pyogenes* in appearance.

According to A. Fränkel⁵ the pneumococcus will not grow on 8 per cent. or 10 per cent. *gelatine* direct from the blood; but from an agar growth cultivations could be made at 25° to 27°. C. Fränkel,² again, says that on 15 per cent. *gelatine* growth will not occur at much more (!) than 24°; while on the other hand Arustamow, quoted by Kruse and Pansini,¹⁰ gave the *minimum* temperature as 28°. This last statement, however, is undoubtedly incorrect. Kruse and Pansini themselves say that most cultivations are possible above 24° or 25°, while, although growth does not usually occur under 20°, in some varieties it takes place at as low as 18°. Further, they say that if a species which originally would not grow at 20° were sub-cultivated in agar for a hundred generations or sub-cultivated in *gelatine* for some months, then it would grow on *gelatine* at 18°. I have obtained an excellent growth on 12 per cent. *gelatine* at 23°, and from it on the fourteenth day inoculated serum-agar with a resultant abundant growth of typical colonies. This time is considerably longer than the life-period ("not much longer than four or five days") allotted to it on *gelatine* by Carl Fränkel. Kruse and Pansini give the duration of life on this medium as about three weeks.

The organism frequently grows very well on plain *agar-agar*, giving on the second day, and frequently on the first, an appearance somewhat like little drops of water, or a transparent veil composed of single drops, while, if the variety be a very active one, even by the second day the separate colonies may be large and have in the centre a somewhat dimpled appearance, or there may be large pearly patches of growth. After the lapse of some time—a week or so—the colonies are apt to become *more* transparent, and sometimes even almost invisible. But the small transparent variety may give rise to the large pearly growths and *vice versa*, and both may appear in the same sub-cultivation. For example, an inoculation on *agar-agar* of some of the heart-blood of a mouse dead from pneumococci septicæmia gave an abundant growth of colonies both "large" and "small"; from the "small" colonies only inoculations were made, and in each of the two sub-cultures colonies both large and small appeared. Again, from two tubes showing only large, flat, whitish colonies two mice were inoculated; each died from virulent septicæmia, and from the blood were obtained films of typical encapsuled diplococci, and cultivations produced abundant growth of small, typical "water-drop" colonies.

With regard to cultivations in *broth*, some very interesting observations have been recorded. Carl Fränkel stated in 1890 that in broth cultivations "the fluid is quite clear; only in very old cultivations is there a slight cloudiness;" but later observers¹¹ affirm that in about twelve hours a cloudiness appears, due to the development of cocci and short chains; after a time these subside to the bottom and the liquid above becomes clear. In broth cultivations from "blood-agar" growths the chains are often long ones, but these streptococci are again converted into diplococci in the blood of an inoculated rabbit. Now, as to the duration of life in broth cultures, Emmerich¹² stated in 1894 that "cultures in bouillon give a sediment in which you find some persistent cells ('dauerzellen') which are able to give evolutions ('entwicklungsfähig') after some months." And this subject has since been thoroughly investigated by Eyre and Washbourn;¹³ they find that in old broth cultivations the majority of the cocci are dead, but a few resistant forms remain living for as long as three months, and by transplanting a sufficient quantity into fresh media growth occurs and a new generation arises. But this new generation represents a distinct variety, differing much from the parent stock, and possesses practically no virulence. It grows luxuriantly even at 20° on all the usual media, and in addition on *acid* agar (on which the ordinary variety never grows), and on potato at 37°; the ordinary variety does "not as a rule"¹⁴ grow on potato, and according to Pearmain and Moor not at all. Further, this non-virulent variety slowly liquefies 10 per cent. gelatine at 20°. In one case, however, out of a long series of rabbits and mice, one rabbit, which for some unknown reason was abnormally susceptible, was killed by this non-virulent variety and in its blood the coccus was found to have reverted to its original type.

As to other media, Kruse and Pansini¹⁰ obtained growths on calf-serum and in ascitic fluid, but could not do so in *milk*, while giving Ortmann's authority that it was possible to do so "in some cases." Crookshank,¹¹ however, definitely states that it grows "in milk, producing casein."

Washbourn¹⁵ grew it in defibrinated rabbits' blood and found that it could live in this medium for as long as fifty-six days.

C.—ALTERATIONS IN VIRULENCE.

As a general rule, it may be stated that, apart from the gradual diminution and final death due to long keeping of an individual cultivation, the virulence of the pneumococcus is diminished by a series of sub-cultivations—although by this

means the bacterium is given a longer life—and exalted by passing through a series of animals. To this latter statement, however, one exception must be made on the authority of Washbourn,¹⁵ who writes: “I have found, too, like Issaef, that sometimes, after repeated passages through rabbits, the virulence has become lessened; but that it has been regained by passage through the body of a guinea-pig.”

But there are several other ways of diminishing the virulence or actually killing the organism, of which perhaps the most important is the action of temperature. Carl Fränkel² reports some very interesting experiments in this direction, which are the more interesting when considered in regard to the part played by the pyrexia of acute pneumonia; he says that if a bouillon culture of the pneumococcus was kept at 42° C., in twenty-four hours it was quite non-virulent, and at a temperature of 41° the same result happened in five days; if the cultures were taken out of the incubator before those periods, the diminution was only partial. A series of rabbits was inoculated with such a partially damaged cultivation; a number became very ill, but only a few died, and these only after several days. Before this, A. Fränkel⁵ had published some similar observations; for instance, gelatine cultivations kept for four days at 41° were found to be virulent but damaged, and when injected into animals hepatisation followed; kept for six hours at 43° and injected, fever was caused, but recovery ensued. Then, on a solid medium (agar), he found that no growth occurred higher than 39.6°, but they were fully virulent at 39°. Muir and Ritchie give the maximum temperature of growth as 42°, while Sternberg gives as the death-point 52°. This last authority also says that a pure culture of the pneumococcus is killed in two hours by HgCl₂ (1 in 20,000). As to the influence of a low temperature, one may mention again here the article published this year by Eyre and Washbourn,¹⁶ who state that while cultures on blood-agar will retain their virulence for sixty-six days if kept at 37°, they lose their vitality in twenty-one days if kept at 20° or at 6°.

Kruse and Pansini¹⁰ make three important remarks on this subject of degeneration:—

(1.) *On the Influence of Toxins.*—It seems, they say, that in bouillon toxins are formed which are fatal to the cocci themselves.

(2.) *On the Influence of Oxygen.*—“And it would seem allowable to suppose that the oxygen of the air is partially responsible for the damage to cultures and to the virulence of sputum exposed to the air.” (They base this statement on

their observations that the *superficial* parts of agar cultures were usually very weak after two or three days, but that from the *deeper* parts it was possible to make an inoculation after three weeks.) I shall have occasion to refer to this theory again later.

(3.) *On the Influence of Light*.—Light, they say, is very damaging to the pneumococcus.

D.—MINOR VARIETIES.

Kruse and Pansini also give a long list of minor varieties, of which some had the faculty of forming peptones, and others of forming pigments, yellow or brown. Fowitzsky, quoted by Washbourn,¹⁵ separated a variety producing a brick-red pigment, and which constantly produced pneumonia in rabbits on inhalation. Foà, quoted by Washbourn, described two varieties—(i.) the “Meningococcus” (from its frequent occurrence in acute cerebro-spinal meningitis) or septic variety, causing death in rabbits in three days without local reaction, with hard and firm spleen, and with blood full of cocci; and (ii.) a “Pneumococcus” or toxic variety, causing death in twenty-four hours, with much local œdema, soft spleen, and few cocci in the blood. Washbourn himself remarks in this connection that he has found the spleen both hard and soft, and occurring in the same series.

E.—INOCULATIONS.

When a virulent culture is inoculated into a susceptible animal (the most susceptible are the rabbit, mouse, and guinea-pig in the order given), an acute septicaemia is usually caused, with death in from about twelve hours to six days, depending principally on the *degree* of virulence of the culture and the amount of the dose. As to the dose, Eyre and Washbourn⁹ record as the result of their investigations that a dose of a twenty-four hours' culture, containing about 200 living cocci, was about the fatal quantity for a rabbit of 2000 grammes, when injected either into the peritoneal cavity or subcutaneously: mice succumbing to about the same dose. The rabbit's blood was always crowded with cocci, while with mice the number in the blood was much smaller. Guinea-pigs were much more resistant; the whole of an agar culture injected into the peritoneal cavity often having no effect, although sometimes, on the other hand, a fatal result was caused by smaller quantities; but, by passing a culture through a series

of fifteen guinea-pigs, the virulence was increased, so that ten times the above fatal dose for a rabbit or mouse was fatal to a guinea-pig of 300 grammes. Fowls and pigeons are quite immune; the rat, sheep, and dog are somewhat refractory, also following in virulence in the order given after that of the guinea-pig.

Shortly after inoculation of a susceptible animal, its temperature begins to rise, while even by the end of the first three hours a few cocci are to be found in the blood, the number gradually increasing till death; for some time before which event, however, the temperature has ceased to rise and has the rather fallen, so as finally to be several degrees subnormal. With regard to the number of cocci in the blood, there are two opinions held. One set of observers, of whom A. Fränkel⁵ may be cited as an example, say that more cocci are to be found after death than in the living rabbit, so that the multiplication goes on post-mortem; the other view may be expressed in the words of Washbourn¹⁵: "I cannot agree with those who consider that the large number of cocci found in the blood at the autopsy is due to a multiplication occurring after death." When I come to discuss the series of inoculations which I have to submit in the latter part of this paper, I shall have to give in my adhesion to the former view rather than to the latter. The pneumococci are usually especially to be found in the spleen (which is very often considerably enlarged, and may be either hard or soft), so that many more colonies will usually be obtained by rubbing a piece of that organ over the surface of an agar or serum-agar tube than by spreading over a like surface several drops of the heart-blood. The lungs are usually congested, often extremely so, but consolidations are never seen in this acute septicæmic poisoning, probably because death occurs too soon for such a local affection to have time to be formed, and if death occur very speedily, in less than twenty-one hours, the lungs may appear quite pale. Carl Fränkel,² indeed, specifically states: "The lungs especially show no signs of infection, and it is certainly not possible to say that the lungs are a place of predilection ('bevorzugte stelle') for the bacterium."

On the other hand, in the case of two mice, the one, mouse R, dying in twenty-three days after inoculation, and the other, mouse S, in two days, the lungs, hardened in Muller's fluid and stained with carmine and by Weigert's method, showed in each case many capsulated diplococci in the alveolar spaces, and in neither case any fibrinous exudation; they appeared congested and slightly collapsed. In the case of mouse R, this was the

only part of the body in which the pneumococci were found. If, however, in dogs and sheep the infective material is brought into direct contact with the lungs, as by injecting it through the chest-wall, you regularly get an intense inflammation of the pleura, and not seldom the lungs are injected, and show more or less patches of consolidation (Talamon, Gamaleia). *True pneumonia* in rabbits, with every characteristic sign, can be made by injecting the bacteria into the trachea, this being the shortest way of getting the bacteria into the lungs; this experiment was first performed by Monti. It is very interesting to note, moreover, that if the cocci injected are partially damaged, as by heating to 41° or 42° for a short time, or by the lapse of time, the result of the inoculation is often not an acute septicæmia, but the production of patches of consolidation in the lungs exactly similar to those produced by a local inoculation. When death occurs at a late period, the most prominent symptom is *great emaciation*, and in such cases a parenchymatous nephritis is often present also.

Washbourn¹⁵ quotes Fränkel and Reiche as having found in cases of human pneumonia changes in the kidney epithelium, and from the juice of these organs having obtained cultivations of the pneumococcus. These organisms may very probably, however, have been contained in the venous blood of the organ, for in very severe cases of pneumonia the pneumococcus may sometimes be found in the blood; indeed, Würtz¹¹ gives as a prognostic sign of extreme gravity the presence of pneumococci in the blood.

Serous inflammations are not infrequently found after inoculation, as was very early remarked by Klein.⁶ I did not see a peritonitis in any of the thirteen mice I examined, but in one case (death in two days) there was double pleuritis and pericarditis, and the exudation in each of these serous cavities was swarming with capsulated diplococci. (It has been said by other observers that pneumococci are very seldom to be found in serous exudations.) In this case the blood also contained many of the same organisms, a fact which does not agree with the statement of Washbourn:¹⁵ "In all the cases where there was pneumonia or pleurisy, the heart-blood only contained a few pneumococci." In all these thirteen cases the blood clotted rapidly, in some of them inconveniently so.

F.—THE PRODUCTION OF IMMUNITY.

Emmerich¹² found that if he injected rabbits with weak cultivations, and gradually increased their strength, he could

make the animals quite immune, so that finally he could inject 30 c.c. of a virulent culture without injury. The bacteria injected were killed in the course of some days, and the serum of such an immune rabbit would *cause the recovery* (zur Heilung bringen) of other rabbits and mice infected with the pneumococcus.

F. and G. Klemperer¹⁸ heated recent broth cultivations to 60° for one to two hours, and then found that immunity could be conferred by the subcutaneous injection of 24 c.c., or in less time, and by a dose of 8 to 12 c.c. if injected into a vein.

Washbourn,¹⁵ working on the same lines, found that immunity so conferred disappeared after the fifty-first day, and has also produced a like immunity by the use of *filtered* cultivations. In the same article he also mentions that Foà had used for a like purpose a glycerine extract of the blood of infected animals.

As to the PROTECTIVE POWER of sera, Washbourn¹⁶ further discusses this subject in another article this year, and there states that the *normal sera* of the rabbit, guinea-pig, and fowl, when inoculated in doses of 0.5 c.c. mixed with a dose of a cultivation of the pneumococcus, will protect against the minimal fatal dose of such a cultivation, although it will not protect against ten times that amount. In 1895¹⁵ (*loc. cit.*) he in some measure corroborated Klemperer's statement that serum from *convalescent* pneumonic patients possesses protective powers, by one experiment in which the rabbit treated by a mixed dose of culture and such serum died in eighty-seven hours, while the control rabbit, who received only the culture, died in thirteen hours. While in the direction of *increasing* the fatality of inoculation, he in seven experiments injected in like manner the serum of a patient in the *pyrexial* stage of the disease, and found that, while in one experiment both animals died in seventeen hours, in all the others the animal who had received the pyrexial serum died before its control. These two sets of experiments are certainly strongly in favour of the specific action of the pneumococcus in the causation of acute croupous pneumonia.

G.—NOW TO CONSIDER THE ACTION OF OXYGEN.

1. *In Pneumonia.*
2. *On the Pneumococcus.*

1. Ephraim¹⁹ stated in 1890 that oxygen inhalations were very useful in pneumonia and phthisis, according to Rehn, Sacchi, and Pingotti, if asphyxia were threatening because of the rapid extension of the process ; but only because the oxygen

allowed an easier respiration. Dr. Pye-Smith²⁰ says in his article on pneumonia: "When dyspnœa is urgent, and the patient apparently dying of cyanosis, the inhalation of oxygen is a rational mode of treatment . . . and sometimes proves remarkably useful."

The teaching embodied in these two quotations seems to be the utmost limit with most physicians to the actual use of oxygen in pneumonia. In this connection I have examined, by the kind permission of Dr. Church and Sir Dyce Duckworth, the records of 342 consecutive cases of acute lobar pneumonia admitted into St. Bartholomew's Hospital, and of that number oxygen was used in the treatment of ten cases only, and in most of those cases apparently only as a last resort. I append the notes as to its administration and effect:—

Case D. J., 120.—Note on seventh day: "Oxygen inhalation ten minutes every hour." No note as to its effect. Crisis on eighth–ninth day. Recovery.

Case C. M., 178.—Note on sixth day: "Delirious and cyanosed; oxygen given." No note as to its effect. Death on seventh day.

Case C. M., 191.—Oxygen administered on fifteenth day. Note: "Oxygen administered once, but of little or no benefit." Recovered finally.

Case C. M., 247.—Oxygen given on fifth day. No note as to its effect. Death on seventh day.

Case D. J., 141.—Oxygen given for six hours on ninth day, when case was considered almost hopeless. Note after three hours' administration: "Face more cyanosed." Death early in tenth day.

Case D. E., 38.—Note on seventh day: "Oxygen was administered and the cyanosis relieved, but not permanently." Recovery.

Case C. F., 196.—Note on ninth day: "At 1 A.M. pulse became very weak and colour dusky; but condition improved after increase of stimulant and inhalation of oxygen (ten minutes every half-hour)." Recovery.

Case C. M., 33.—Oxygen ordered on day before death on fifth day. No note as to effect.

Case C. M., 87.—Note on tenth day, 5 P.M.: "Condition worse; more restless and delirious; colour much worse, face livid; pulse weaker, volume much diminished. Oxygen gas given as an inhalation with marked and rapid relief." Note at 8 P.M.: "Still inhaling gas; colour improved, also volume of pulse." Oxygen given at intervals up to thirteenth day. Recovery.

Case C. M., 162.—Note on tenth day: "Inhalation of oxygen at intervals, which seemed to give relief." Recovery.

It is quite evident from a consideration of the above notes that the benefit when obtained could not have been from any action on the pneumococcus in the lung, because, in the first place, in only one case (*C. M.*, 87) was it used for more than a few hours in all; and, secondly, the improvement noted was always an *immediate* effect.

Yet there are two reasons, both founded on observation of facts, that might lead one to suppose that if the lungs could be kept filled with a super-oxygenated atmosphere for a considerable space of time, and early in the disease, some effect might be produced directly on the pneumococci themselves, and so on the course of the disease.

The first reason is founded on the post-mortem examination of cases of croupous pneumonia. In such cases the greatest number of pneumococci are always to be found in the youngest part of the inflammatory mischief, in parts more particularly which have reached the stage of "acute congestion," and not yet become actually hepatised. Now, when one considers a series of cases of this disease (post-mortem), it appears to be the case that in many of them a fatal result would very possibly not have come to pass had the disease process remained limited to the part of the lung first attacked. There is very often to be seen present a recent extension of the mischief to some further portion of the pulmonary tissue, following on which extension the patient died. To test in some degree the correctness of this impression, I have examined the records in the Post-mortem Register of St. Bartholomew's Hospital of 32 consecutive examinations of cases of pneumonia (omitting one other which is noted as "R. lung solid throughout, structures too decomposed to describe), and out of this number I find 15, or rather more than 46 per cent. in which there was evidence of a recent extension of disease. I append a few such notes:—

Report 65.—R. lung solid, except small area at extreme base; upper $\frac{3}{4}$ grey, lower $\frac{1}{4}$ red, hepatisation.

Report 167.—L. lower lobe grey, and a large part of upper lobe. R. lung, base congested.

Report 390.—R. upper lobe grey, middle lobe adherent to upper lobe, and, where adherent, granular for a depth of $\frac{1}{4}$ inch, showing extension of pneumonic process; base engorged and cedematous; L. lung cedematous.

Thus, although one may perhaps admit that it would be practically impossible for an atmosphere such as indicated to be

brought to bear on the portion of lung first involved, inasmuch as by the time the affection is frequently under treatment and diagnosed that portion of the lung is already blocked and impervious to air; yet if such a means of treatment should be effective in preventing the extension of the activities of the micro-organism in question to fresh fields of activity in the lung, it would probably obviate a certain proportion of the fatalities.

2. The second reason to be brought forward, and this as to the possibility of oxygen having the action indicated, I have endeavoured to investigate by certain experiments to be now described, after first giving an exact quotation of the words of Kruse and Pansini,¹⁰ briefly alluded to previously: "Dass auf der Oberfläche des Agars die Mikro-organismen schnell absterben . . . (319)." "In hohen Agarschichten ist die Lebensdauer grosser . . . Daraus lässt sich schliessen, dass *der Luftsauerstoff mit an der schädigenden Wirkung beteiligt ist* (320)." "Auch auf fein verteiltes sputum dürfte die desinficierende Wirkung des . . . Sauerstoffs der Luft . . . eine bedeutende sein (323)." (The italics are mine.)

In this investigation I did not propose to attempt to grow the pneumococcus in an atmosphere of *pure* oxygen, as it would be evidently quite impracticable to use such an atmosphere in the clinical treatment of cases: my method was therefore as follows:—The test-tubes containing the cultures to be subjected to the super-oxygenated atmosphere—that for the purposes of this paper I label briefly "oxygen"—were very lightly (so as to permit of easy diffusion) plugged with sterilised "Egyptian cotton-wool," and then placed in a glass cylinder about ten inches in height and able to be closed by a glass lid tightly screwed down on to an india-rubber washer. The pure oxygen, obtained from a cylinder of that gas under pressure, was passed to the bottom of the cylinder by a long rubber tube, and, when most of the air was judged to be displaced, the lid was quickly fastened down; the control tubes were placed in a similar cylinder filled with the ordinary atmosphere. In order to have a definite idea as to the percentage of oxygen thus present, on two separate occasions I charged the cylinder, containing "dummy" test-tubes, in the usual way, and, after placing them in the warm incubator till the next day, as had been my custom with the cultivations, I then submitted the contents to examination. The first trial was made by absorbing the oxygen by the action of caustic potash and pyrogallic acid, and the second by Hempel's nitric oxide method. In each of these two control experiments the percentage of oxygen present was found to be

43, so that this may be safely taken as the usual composition of the "super-oxygenated atmosphere." Roughly, therefore, this latter contained about twice the usual quantity of oxygen.

FIRST TO CONSIDER ITS EFFECT ON THE ACTUAL GROWTH OF COLONIES.

For this purpose I will tabulate only the inoculations in which identical control tubes were made at the same time, and I shall divide them into two sets: (i.) those made on serum agar, and (ii.) those made on agar-agar, for the reason that the effect of the oxygen seemed much more manifest in the case of the former set than in that of the latter.

TABLE I.—*Serum Agar.*

Oxygen.		Air.	
A ¹⁹	N (=No growth).	{ A ¹⁷ A ¹⁸ A ²⁶	Growth. Growth. Colonies, less distinct at end of a week than A ²⁵ .
A ²⁵	Rather the smaller colonies to begin with.	E ²	Colonies of nearly equal size.
E ¹	N.	F ⁵	Colonies of nearly equal size.
F ⁴	N.	H ²	N.
H ¹	N.	I ²	Colonies of nearly equal size.
I ¹	N.	I ⁶	N.
I ⁵	Small similar colonies at first, becoming larger at edge later.		
These, I ⁵ and I ⁶ , were inoculated from a growth which had been grown in oxygen.			
J ⁷	N.	{ J ⁸ J ¹¹ J ¹²	Typical colonies. Very abundant colonies, many becoming very large.
K ¹	One colony.	K ²	40 colonies.
K ³ was kept in air for one day and then placed in oxygen; at the end of two more days twenty colonies were noted; after it had been finally removed from the oxygen a new streak of growth appeared down one side.			
K ⁷	Fairly equal large colonies.	K ⁸	N.
L ¹	Small typical colonies with some large ones round edge.	L ²	Small typical colonies.
M ¹	Colonies, mostly large and ringed.	M ²	Many of the colonies large and ringed.

From this table it will be seen that out of twelve inoculations placed in oxygen from the beginning, only six developed growth, *i.e.* 50 per cent., while out of fifteen exactly similar

ones placed in air, twelve developed growth, *i.e.* 80 per cent. The general conclusion to which I have come with regard to comparative inoculations thus on serum-agar is that on the whole the presence of the excess of oxygen is inimical to the starting of a growth, but that if growth once begin it appears to become acclimatised to the altered environment, and the final condition of such colonies is not very different to that of those grown under the usual conditions. The set K¹ K² K³ may be especially alluded to in this connection; while in the only instance in which duplicate inoculations were made from a culture grown in oxygen, K⁷ and K⁸, the inoculation kept in oxygen grew, while that in air did not.

TABLE II.—*Agar-Agar.*

Oxygen.		Air.	
A ²⁷	The larger colonies.	A ²⁸	The greater number of colonies.
A ²⁹ in oxygen after one day, abundant colonies.			
E ³	Many colonies of two varieties. Many of the large variety.	A ³⁰	Abundant colonies.
E ⁸	Two varieties, many large.	E ⁴	Many colonies of two varieties. One large one only; each variety bigger than the corresponding set in E ³ .
E ¹⁰	A few large, a few very small.	E ⁹	Two varieties, few large.
F ⁶	Many colonies.	E ¹¹	Many, both large and small.
H ³	N.	F ⁷	Many more colonies.
I ³	N.	H ⁴	N.
J ⁹	N.	I ⁴	Three large colonies.
J ¹³	Both large and small colonies.	J ¹⁰	N.
K ⁵	Abundant growth.	J ¹⁴	Both large and small colonies; many considerably larger than in J ¹³ .
L ³	Many smallish colonies of uniform size and faint.	K ⁶	Abundant growth.
M ³	Numerous colonies.	L ⁴	Many colonies, some a little larger, and some a little smaller than in L ³ ; all faint.
		M ⁴	Numerous colonies.

From this table it will be seen that out of twelve inoculations placed in oxygen from the beginning, nine developed growth, *i.e.* 75 per cent., while out of thirteen exactly similar ones grown in air eleven developed growth, *i.e.* 84.6 per cent. Moreover, in this set also one other inoculation, A²⁹, placed for the first day in air, developed growth, and although afterwards placed in oxygen, the final result seemed in all respects similar in appearance to its control in air.

TABLE III.—*As to Atmosphere of Source.*

The following small table is that of some sub-cultivations obtained from a twin pair of cultivations, of which one, M³, had been kept in the oxygen jar, and the other, M⁴, in the air jar. In addition, the sub-cultures from M³ were kept in oxygen and the sub-cultures from M⁴ in air.

Age of Parent Colonies.		Oxygen.	Air.	
3 days.	M ⁸	N.	M ⁹	One colony.
4 days.	M ¹⁰	Large colonies.	M ¹¹	Rather more colonies, but many small ones.
5 days.	M ¹²	Many large colonies and some ring ones.	M ¹³	Many more large colonies, and small ones also.
6 days.	M ¹⁴	Some faint colonies.	M ¹⁵	Many faint colonies, and four large ones.

Of this series M³ and M⁹ were on serum-agar, while the remainder were on agar-agar. One would have expected in the ordinary way that this pair would have shown most growth as being inoculated from younger cultures, but as in the previous tables, the oxygen seemed to have more effect on the one concerned than in the agar set; of these latter, the air cultures were slightly more abundant than the oxygenated ones.

NEXT TO CONSIDER THE EFFECTS OF INOCULATIONS ON MICE.

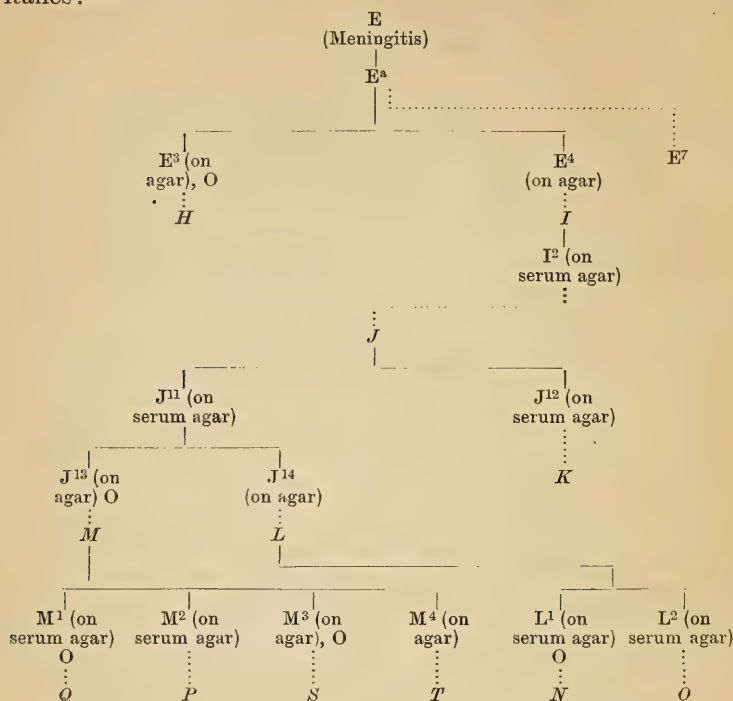
In all cases the method of inoculation was the same: about a hypodermic syringe-ful of sterile broth was run into the test-tube and tilted backwards and forwards over the surface of the medium so as to wash off all the superficial parts at least of the growth, and was then inoculated under the skin of the lumbar region. (The responsibility of the actual inoculation of these mice was kindly undertaken by Dr. Andrewes, as I have not at the present time a license under the Vivisection Acts.)

The following is a complete list of the inoculations:—

Mouse.	From Culture.	Age of Culture.	Atmosphere of Culture.	Time of Death.	Time of Examination.	Number of Pneumococci.
E ⁷	E ^a	2 days	Air	2 days	(not noted)	Growth in 2 inoculations out of 2.
{ H I J	E ³	2 days	Oxy- gen	71 hrs.	Same day	Very few in blood; no growth out of 4 inoculations.
	E ⁴	2 days	Air	74 hrs.	Next day	A fair number in blood; growth in 2 inoculations out of 4.
	I ²	1 day	Air	22 hrs.	Same day	Some in blood; growth in 1 inoculation out of 4. Many in spleen; growth in 2 inoculations out of 2.
K	J ¹²	4 days	Air	22 hrs.	Same day	Some in blood; growth in 3 inoculations out of 3. Many in spleen; growth in 2 inoculations out of 2.
L	J ¹⁴	3 days	Air	20 hrs.	Same day	Some in blood; growth in 2 inoculations out of 2. Many colonies from spleen; growth in 2 inoculations out of 2.
M	J ¹³ ($\frac{2}{3}$ dose)	3 days	Oxy- gen	32 hrs.	Next day	Many in blood; growth in 2 inoculations out of 2. Many colonies from spleen; growth in 2 inoculations out of 2.
N	L ¹	4 days	Oxy- gen	18 hrs.	Soon after death	Some in spleen— Spleen 1 out of 1 Lung 2 out of 2 Blood 1 out of 1 } Some growth.
O	L ² ($\frac{2}{3}$ dose)	4 days	Air	36 hrs.	Some hours after death	Many in spleen— Spleen 1 out of 1 Lung 1 out of 1 Blood 1 out of 1 } Covered with colonies.
P	M ²	4 days	Air	16 hrs.	Some hours after death	Very many in blood. Spleen— Growth in 1 out of 1 inoculation. Lungs (pale)—1 out of 2. Blood—1 out of 1.
Q	M ¹	4 days	Oxy- gen	21 hrs.	Soon after death	A good many in blood. Spleen— Growth in 0 out of 1 inoculation. Lungs—2 out of 2. Blood—1 out of 1.
S	M ³	6 days	Oxy- gen	2 days	Next day	A large number in blood. Blood— Growth in 1 out of 1 inoculation. Spleen—1 out of 1.
T	M ⁴	6 days	Air	1½ days	Next day	A good many in blood. Blood— Growth in 1 out of 1 inoculation. Spleen—1 out of 1.
R	F	3 days	Air	23 days	1½ days after death	Cocci in alveoli of lungs, nowhere else in body.

All these inoculations (with the single exception of R from F⁵, which was a descendant of a cultivation obtained post-mortem from a case of lobar pneumonia fatal on the eighth day) were obtained from one original stock, the specimen labelled E, which was derived from a fatal case of cerebro-spinal meningitis; and the exact generation of each will be seen from the following diagram, in which inoculations on media are printed

in ordinary type while inoculations into mice are printed in italics:—



Firstly, it will be noticed, on studying together these two tables, that the virulence, as judged by the time of death of the mouse compared with the age of the inoculation culture, steadily increases on the whole from generation to generation after the first one.

Then, to consider the question mentioned before as to whether the alleged multiplication of pneumococci in the blood after death be or be not true in fact. Examine for evidence on this point the five *pairs* of experiments: it will be found that without exception in each of the four pairs where one animal was examined some time after the other (I after H, M after L, O after N, P after Q), the larger number of pneumococci was found in the blood of the second animal examined. Again, take the two cases J and K, where death occurred in twenty-two hours after inoculation with one day and four days' cultures respectively, and compare them with S and T, in which death occurred in two days and

one and a half days respectively after inoculation with six days' cultures—according to the statement of Weichselbaum and Monti (quoted above), the earlier and the fresher the disease process, the more of the diplococci are present, and the later, the fewer, wherefore one would expect a greater number to have been found in J and K than in S and T, but, on the contrary, by far the larger number were present in S and T, which were examined a day and a half after death, and not in the pair which were examined on the day of death itself. So that, for these reasons, I cannot but agree with the teaching of Fränkel on this point rather than with that advanced more recently by Washbourn, and believe that a considerable multiplication of the number of pneumococci in the blood does take place after the death of the host.

Finally, as to the apparent influence of the *Oxygen*, as measured by the time between inoculation and death. In cases L and M and N and O, where the dose was very unequal, the more fatal result was simply on the side of the larger dose, and one cannot draw any decided conclusions as to the action of the differing atmospheres one way or the other. Then, in cases H and I, inoculated from agar-agar cultures, on which class I have given reasons above for supposing that oxygen has less influence than on serum-agar inoculations, there was a difference of three hours in three days, so that the virulence may be stated as being in the ratio of 71 to 74, or, taking the virulence in air as 100, the virulence in oxygen was 104. But, in P and Q, inoculated from serum-agar, the virulence measured in the same way was as 100 to 76; while in P and Q, inoculated from agar-agar after two days longer for the atmospheric conditions to have an effect, the proportions were as 100 to 75.

CONCLUSION.

Taking the foregoing observations altogether, therefore, I am led to conclude that a super-oxygenated atmosphere (in this case, as stated above, having about twice the usual proportion of oxygen) has some effect in lessening the power of growth and the virulence of the pneumococcus.

Doubtless some more decisive information could be obtained by making cultures in a similar way to that described above and growing them in an atmosphere of *pure* oxygen, or anyhow one having a much higher proportion of that gas than I have employed; but such an investigation was outside the scope of the present inquiry, for the clinical reason already stated.

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STOMACHIC PHENOMENA DURING CHLOROFORM ANÆSTHESIA.

BY

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There are two series of phenomena which may occur during chloroform anæsthesia, and, probably because of the irregularity of their progress, more certainly because of their mode of onset, they are apt to create alarm on some occasions, and on others more anxiety than is warranted by the true manner of their causation.

When, within a few seconds, breathing is suspended by the normal process of reflex inhibition, there is undoubtedly sufficient ground for alarm, but this should be confined to a reasonable limit, and never reach such a degree as to seriously affect our judgment. And unless a complete survey of all the forces in operation be made, including the degree with which each force is acting, there is too great a tendency to ascribe the untoward but quite natural event to the direct and abnormal influence of chloroform. A rapid change comes over the aspect of affairs, and the state of the patient becomes at once critical. There is but very little time to come to a conclusion; it is easily seen that the patient is off the normal lines of anæsthesia, but what is the cause of the deviation? At such a juncture it is not necessary to inquire into the cause or causes. What is imperative is to be quite sure all our efforts are efficiently directed towards recovering the patient. And, fortunately for the chloroformist, the treatment, whatever may be the cause or combination of causes, is with some minor differences always the same. But though knowledge of the cause is not absolutely requisite, provided the proper treatment be applied, yet it is of use in dissipating our fear, and tending to the maintenance of that equanimity without which error may be committed. The knowledge of causation, therefore, whether simple or complex,

creates confidence in the chloroformist. If the right road be lost to him, he has observed, if time permits, the antecedent changes; he knows the exact abnormal path the patient is, despite his precautionary measures, forced to take, and consequently he proceeds without fear to steer clear of the immediate and secondary effects of the complicatory cause. On the other hand, if he finds his patient in an abnormal state, and is ignorant of the cause, alarm and anxiety under these conditions are of no avail. What is needed, and the need is immediate, is to direct the patient into a position of safety.

In the second series of abnormal phenomena which affect the two prime functions of circulation (primarily, systemic; secondarily, cardiac) and respiration (sympathetic), there must always be cause of anxiety. But this anxiety has, or ought to have, reference not to the new path which the patient has entered, but to the accuracy with which the anæsthetic has been administered. For in all instances of complications, associated directly or indirectly with the stomach—and it may also be added from all other causes—patients recover best and easiest when chloroform is present in the minimum or anæsthetic amount. And just as the occurrence of a complication obscures the proper range of action of chloroform, so all excess of chloroform interferes with the natural progress of the complicatory cause—a result which may have a serious influence on the patient's safety, though in itself, and apart from the presence of complications, it does not threaten immediate danger to life. And my opinion is that the various and often widely differing descriptions of grave states, sometimes ending fatally, depend on the concurrent action of several forces which in successive cases are differently combined and exercise varying degrees of effect in their combination. But these forces do not always come into operation simultaneously. Hence there is the danger of overlooking the remote effects, which may, if we take the example of the falling back of the tongue, be more deadly than the primary ones.

The phenomena to which allusion has just been made comprise—(1.) Changes in the respiration and the terminal arteries controlled by the vaso-motor system; and (2.) Secondary effects consequent on these primary alterations. Respiratory variations affect sympathetically the frequency of the heart's action. Vaso-motor constriction, associated with pallidity, is followed (after a temporary effort of increased vigour) by a diminution in cardiac strength. Thus the heart is secondarily influenced by two causes. Sweating also is a frequent phenomenon, and the pupil may undergo dilatation, but this is not constant;

and the dilated pupil of stomachic disturbance reacts readily to light. These complications may occur with surprising rapidity and without any appreciable warning, or they may be preceded by premonitory signals and pass through well-defined stages, which may vary in intensity and duration. In order to become familiar with their nature it will be best to describe typical cases.

I. The first case is one in which the attempt to prepare the boy for operation had signally failed. He was an only child and an heir; it had not been thought necessary to acquire the services of a nurse—the operation was for adenoids—and a copious meal had been given one hour and a half before the time appointed. There had been no prolonged anxiety undergone by the little patient, which so often acts unfavourably in older people. He was brought into the room set aside for the operation from the garden, where he had been playing, hurriedly undressed, and placed upon the table. Chloroform was administered, and the gag applied before anæsthesia was attained. When the breathing became automatic, indicating unconsciousness, and, after a little while, the pupil became pinpoint, indicating the anæsthetic degree of unconsciousness, the patient was placed on his right side. Up to this period, there had been no change in the colour of the complexion. As the operation was about to be begun, the face became rapidly pallid and respiration was suspended. There was a short interval of a few seconds, during which the residual chloroform in his lungs was expelled by squeezing his lower ribs; the pupil remained pinpoint, and there was no difficulty presented by the tongue. The patient next inspired deeply, and immediately afterwards vomited a very considerable quantity of foodstuffs in various stages of digestion. After which, with the recovery of respiration, his colour returned, the pupil still remaining pinpoint; and thus being in a proper state for operation, the adenoid growths were extracted and the tonsils removed without any further mishap. The onset of the complication was rapid, and the return to the normal state after the removal of the exciting cause was also equally rapid. The operation over, the blood was removed from time to time, the gag being still applied, and at the end of five minutes approximately there were signs of returning consciousness; the pupil began to dilate and the conjunctival reflex was present. But with the advent of returning consciousness, the respiration was observed to become shallow, the face pale and covered with perspiration, and the pupil was widely dilated. This condition continued for a few

minutes, when before a second attack of vomiting the breathing was arrested in full inspiration. But this time the vomited matter consisted of black blood, which he had swallowed during the operation, and which had become altered during its short stay in the stomach. When the second act of vomiting ceased the little patient became conscious very quickly and was put to bed.

Two points stand out prominently in this complication. First, the necessity of constantly watching the patient, so as to detect at its outset the deviation from the normal course of anæsthesia; and secondly, the value of preparation, in order to prevent, at any rate in the earlier stages, the stomach from acting. And, in my judgment, many of the grave situations arising in the progress of anæsthesia originate in the stomach. So much so, that if the influence of the stomach could be abolished, I believe one-half the number of fatal cases would disappear. But it is impossible in every instance to achieve the desired condition of a quiet stomach. In infants and young children anæsthesia has to be induced with the contents of the stomach in every stage of incomplete digestion. It is amongst the very young, as evidenced by experience in the Surgery of St. Bartholomew's Hospital, that stomachic disturbance is most prone to occur. And unless care be taken to regulate and control the action of chloroform, they also provide by far the larger group of mixed complications; that is to say, while the stomach is in a state of activity, the influence of chloroform may become excessive in one of two ways. Relatively, when the amount is not diminished in accordance with the shallowness of the breathing, the lungs thus becoming overdosed, and rendering artificial respiration necessary at the moment the stomach inhibits respiration, antecedent to the act of vomiting; or absolutely, when in the case of the irregular administration of chloroform, there is an overdose introduced not only into the lungs, but into the blood as well, and when the overdose is gradual in its progress, the danger is all the more. To steer clear of this danger, method in the administration of chloroform is practised so as to limit the range of its action, and this method should on no account be departed from. For it is an axiom that, given normal conditions, the effect of chloroform is ruled by its quantity, and this quantity is determined by the amount and quality of the blood into which it is absorbed and upon which it directly acts. For if no such method be used, there can be no constant state of anæsthesia, and without the limitation of the chief agent, there can be no means of ascertaining the effects of other agents, and of elucidating the causes

of phenomena, which occur during chloroform anæsthesia, and which tend to obscure the action of chloroform, but which have nothing to do with its proper effects.

The object, therefore, of limiting the influence of chloroform to its minimum or anæsthetic degree is of the very first importance. For, first, chloroform can thus never of itself act in a way which may be injurious, even for a short while; and, secondly, it becomes possible to define with accuracy the effects of another cause acting concurrently with it. It becomes, therefore, matter of ease, from the observation of abnormal phenomena, and the separation of those which are similar into particular groups, to study the causes of these complications, and when found, to counteract them. Thus slight mechanical obstruction to respiration is removed, and the action of the stomach allowed to continue without confusing the effect of chloroform. And in this way alone is the complication defined, obscurity dissipated, and anxiety set at rest.

In the typical example just narrated there is shown the reward for being prepared for all eventualities. In the first place, the mouth was open, and the air could enter freely or as freely as was determined by the naso-pharyngeal and tonsillar obstructions. In the second place, chloroform was present in the minimum dose. The tongue and jaw gave no trouble on this occasion. But they may at times, and it is always best to be quite sure that they do not add any increase to the already existing obstacles to breathing. If there had been excess of chloroform in the lungs, a longer period would have intervened before a full inspiration was possible. If an excess in the blood, as measured by the degree of dilatation of the pupil and its sluggishness or insensitiveness, the interval would be further prolonged and the danger to life proportionately enhanced.

But it may be objected, and it is well to take the objection from the first, Is this in reality a case of stomachic action during chloroform anæsthesia? Is it possible for the stomach to act while the patient is anæsthetic? And the reply is, that in human kind, involuntary organs are not affected by chloroform in any dose, anæsthetic or narcotic, with a single reservation. And this reservation consists in the interference to their nutrition caused by the presence of a foreign substance in the blood, not simply circulating in it like many drugs, but acting upon it. For if observation be made, with varying amounts of chloroform, it will be found that as the quantity of chloroform is increased, so the arterial blood loses its bright red hue, and becomes dark. It also undergoes another change, and, losing its consistency, takes on the character of venous blood. An

excess of chloroform in the blood, therefore, points to a decrease of oxygen—a conclusion which is supported by the presence of those other phenomena associated with the de-oxygenation of the blood, viz., the distension of the veins, the lividity of the complexion, the dilated pupil, the laboured breathing, and the increased tension (at first) of the pulse. But does the action of chloroform stay here, with a diminution, varying in amount according to the quantity used, of the oxygen in the blood? By no means. As the action of chloroform is increased, it passes from a simple interference with oxygen supply to the destruction of the coloured blood corpuscle, the oxygen carrier. Chloroform may circulate in the blood, with a minimum amount of disturbance, when it is limited to the degree of anaesthesia, but beyond this stage chloroform becomes pernicious, and with the gradual or rapid destruction of the coloured corpuscles, acts as a blood-poison. Chloroform, therefore, interferes with the functions of the stomach so as to cause their delay or arrest only when it is present in a poisonous dose, and it exercises the same deadly effect on every other organ of the body. With chloroform present in the least amount necessary for the object in view—anaesthesia—its influence upon the stomach must thus be the least possible so far as nutrition is concerned. But clinical experience provides further proof in favour of stomachic action during chloroform-anaesthesia. It is well known that during returning consciousness after chloroform there is a tendency to sickness. All the signs may be present which indicate stomachic disturbance, but the discriminating signs are the dilated pupil, which is always sensitive, and the occurrence of movements which are always purposive. If this deviation from the normal course of anaesthesia happen during the progress of an operation, the remedy is to augment the amount of chloroform to the degree necessary to maintain the patient in a state of anaesthesia. This deviation from the normal is a fault of administration and is easily corrected. To assume, however, that all instances in which stomachic phenomena occur are due to the same cause—a decrease in the amount of the agent in use, and put into force the same treatment—the addition of chloroform—without any regard to the presence and interpretation of the determining factors, involves very considerable danger to the patient. And upon this danger it is impossible to lay too particular stress. For if observation be constantly and closely carried out, and records taken at the time, there will be found, after a consideration of all the cases in which the phenomena proper to stomachic disturbance are

present, two distinctive sub-groups; one in which the pupil is contracted or even pin-point, and the other in which the pupil is dilated and readily reacting to light. Further, in the sub-group of the contracted pupil there will be seen two divisions—the first characterised by the maintenance of the contracted pupil, and the second by the onset, in the course of the complication, of its dilatation. This difference is explained by the varying conduct of the stomach; when its action is quick, there is, apart from the complication, no other disturbance to the normal course of anæsthesia. On the other hand, when it is sluggish, the reflex influence on the respiration may be so intense as to prohibit the administration of chloroform for a while, and thus decrease its amount in the blood. Now, if this rule be neglected of varying the quantity of chloroform with the altered state of the breathing in the group of cases characterised by the contracted pupil, the danger is run of overloading the lungs just at the very moment when they ought to be as free as possible of any mechanical obstacle. For when the stomach is about to empty itself, respiration is arrested in full inspiration. If this be unhindered, vomiting pursues its natural progress. But if the conditions be unfavourable, if a temporary excess of chloroform be present in the lungs, then, when respiration is reflexly arrested, artificial means are needed to place the patient in a position of safety. Thus from incomplete observation, in other words, from assumption, there springs the origin of all that is obscure and much that may be disastrous. For (*a*) it is no small error to mistake cause for effect, and (*b*) when a patient is normally anæsthetic as determined by the period antecedent to the complication and by the persistence of the contracted pupil during it, which in itself is a sign of unconsciousness and measures the degree of it, to attribute all stomachic phenomena to returning consciousness, and (*c*) in defiance of the existing conditions, respiratory inhibition and vaso-motor depression, to hazard the life of the patient on a dogma.

The second typical example is as follows:—The patient, a young and healthy man of twenty years, was prepared for an operation—the radical cure of a right inguinal hernia. He had not previously exhibited any signs of fear, and the induction of chloroform-anæsthesia was normal. During the early stages of the operation there was observed some irregularity in the abdominal movements complicating their automatic action, and there were heard rumblings of the intestine. All these disappeared, but shortly afterwards were followed by an appreciable decrease

in respiratory action, as shown by the restrained action of the abdominal muscles. With this altered state of the breathing there was noticed a slight pallor of the complexion. The amount of chloroform was at once diminished in response to the new conditions presented by the patient, and the jaw and tongue put into their normal position, so as to ensure absolute patency of the respiratory passage. There was no change in the state of the pupil, which remained pin-point. As the breathing became still more and more shallow, and the complexion more and more pale, the chloroform was further reduced, till, the breathing becoming almost imperceptible, it was discontinued. At this juncture the patient was perspiring freely, the pulse was thready and its frequency increased; but the pupil remained pin-point throughout. The duration of this stage of the complication, from its beginning up to the moment when respiration was inhibited almost to the point of suspension, was about twenty minutes. At last breathing was arrested in full inspiration, and the contents of the stomach expelled. These consisted of gastric mucus, some of the saliva which had been swallowed, and yellow bile. During the process of vomiting the complexion became first of a normal colour, then congested; the pupil dilated, but easily reacted to light, and the pulse returned to its natural volume. With the cessation of stomachic action the patient resumed the normal condition, and the operation, which had not been interrupted by this long-continued complication, was completed without the occurrence of any other abnormal phenomena.

This instance allows of some interesting and instructive comments. And, first, reference may be made to the insidious progress of the signs and the time occupied before they reached the stage of maturity. The value of close observation, in order to detect at its beginning the play of a collateral factor acting concurrently with chloroform, is justly appreciated. It makes us direct our effort less to chloroform than to the subsequent and anticipated results of the action of the stomach. Before the act of vomiting can take place the respiratory machine, already inhibited by internal reflex impulses, must be free of even a slight excess of chloroform in the lungs; and the new phase of the respiration, traced to its true cause, points to a reduction in the amount of chloroform given, this being diminished at the earliest manifestations of respiratory inhibition and vaso-motor disturbance, and still further reduced *pari passu* with the increasing shallowness of breathing.

If this reduction in the amount of chloroform, in order to meet the new condition of respiration, be not practised, then there

follows of necessity a gradual overdose in the air-passages, which again is followed by an equally gradual overdose in the blood. Thus the respiratory machine becomes trammelled in its functions from two sides. It is reflexly inhibited, and the restrained action is aggravated by either an absolute or relative overdose of chloroform in the air channels (interfering with the efficient transit of air), and by the congestion of the lungs consequent on an increased amount of chloroform circulating in the blood. Hence is explained the differences in the lengths of time in recovering patients from states of gravity in which chloroform plays a part, but, fortunately, when it has been methodically administered, only a secondary one. If no method be used to define and limit the action of chloroform, then the resulting overdose may become absolute, and the danger to the patient is proportioned to the amount of chloroform in excess. But however close our observation may be, yet from an accidental attribute of the course of this complication—its tendency to an almost imperceptible progress—another factor may appear to deceive the sense. The respiratory machine may be reflexly restrained, but in order to meet and if possible overcome the mechanical obstruction supplied by a relative overdose of chloroform in the lungs, Nature puts forth her reserve powers, and brings into action the extraordinary muscles of respiration. But though the false state of the respiratory machine may thus lull our sense into a deceptive security, an examination of the pupil will at once put us on the right track. For it is a conclusion drawn from experience that, with an overdose of chloroform in the blood, the pupil becomes dilated, the degree of the dilatation corresponding to the amount of the excess. If, therefore, an overdose of chloroform methodically administered be very gradually and otherwise imperceptibly introduced into the blood through respiratory changes, observations on the state of the pupil will lead us, where it is beginning to dilate, at once to inquire into the cause.

And this is an example to warn us that we should never trust to any single sign, for each, under set conditions, is fallacious. Did we trust to the respiration without reference to the pupil, the state of the patient would tend to become more and more grave. Thus, as the gradual accumulation of chloroform in the blood is proceeding, the right side of the heart is becoming distended, and in a manner so gradual that it may escape detection. But the heart cannot continue in this abnormal state for any length of time. In the first place, it has a mechanical obstacle to contend with—the distension, reaching, perhaps, by slow degrees to over-distension of its

right side; and in the second, its nutrition is being continuously degraded, from the presence of a poisonous but not immediately fatal dose of chloroform in the blood, interfering with the due and proper amount of oxygen necessary for normal nutrition—an interference which is temporary at first, but afterwards by the destruction of the coloured blood-corpuscles becomes permanent. Much, therefore, depends upon the initial vigour of the heart and its capacity to overcome the obstacles thrown in its way. If these be too great, it fails, while the respiration may continue. But let it not be supposed that chloroform in these complicated conditions is the prime and only factor in the causation of death. Such a catastrophe would be impossible without the reflex inhibition of respiration caused by stomachic disturbance; for it is just this alteration in the state of the respiration which leads, if the anæsthetic be not reduced as directed above, to the very evil which it ought to be our utmost endeavour to avoid.

In this complication the observation of the pupil will with all certainty inform us what is the exact degree of the action of chloroform; for if the pupil, after having been pin-point, becomes gradually dilated or remains at a moderate state of dilation after the onset of the complication, it is with one exception due to the over-action of chloroform. (And this over-action is relative when chloroform has been methodically administered, but the method has not been changed to meet the abnormal condition of the breathing.)

The exception alluded to affects the condition of the air-passages at that part where the tongue is prone to fall back and carry the epiglottis with it over the entrance into the larynx. When vaso-motor disturbance occurs as a consequence second in point of time after respiratory inhibition of stomachic action, the muscles are relaxed, and the tongue, taking the position gravity gives it, may obstruct more or less, or may even block altogether, the road to the lungs. And here, again, it may be remarked that the less the degree of obstruction, the greater the danger from the gradual and unobserved increase in the amount of carbonic acid in the blood. There is another factor to be attended to besides the variations in the phenomena of stomachic action and the alterations in the amount of chloroform administered. It is to keep the air-channels as patent as they can possibly be kept during the continuance of the complication. In every instance, even in typical cases of anæsthesia, our attention ought never to be diverted from this object; for oxygen, being the natural opponent of chloroform, must always be present in sufficient amount to prevent its destructive effect

on the coloured blood-corpuscles. And this pernicious action on the part of chloroform is accelerated when circulation is impeded, as by the congestion of the lungs and by the presence of an excess of carbonic acid in the blood. Mechanical obstruction in the air-channels, caused by the dropping of the jaw or the falling back of the tongue, becomes a twofold source of danger. First, it hinders the normal aëration of the blood, and secondly, if chloroform be administered under this dangerous condition, it permits of the oxygen-carriers becoming more easily destroyed than would be the case if they contained their proper amount of oxygen.

Examples I. and II. show in a well-defined manner the differences in mode of onset and progress of development of complications immediately consequent upon stomachic disturbance, and between these extremes experience presents us with every variety of degree. It is probable that these variations depend upon the stage of digestion the contents of the stomach have reached. But vomiting does not always follow the appearance of these abnormal phenomena, and this exceptional deviation from the usual progress of results suggests the idea of the stomach emptying itself sooner than is its wont into the small intestines.

It will be seen the phenomena associated with stomachic disturbance affect directly the respiratory and vaso-motor centres; the heart is but sympathetically influenced in order to become adapted to the altered breathing and the contracted arteries.

With regard to Example III., it is questionable whether it should find a place here, even though the phenomena involved are in some part the same as presented by II., and in another have more than a mere superficial resemblance. In Example III. the stomach is indirectly affected; it is not, as in II., the immediate and sole existing cause of the complication. The cause of Example III., a typical instance of vaso-motor disturbance, arises in nerve stimulation. The sympathetic nervous system most readily lends itself to this complication, and it is exaggerated when the parts containing the nerves are inflamed, and when traction is exercised upon them. Thus, in operations for (*a.*) intussusception, when the bowels are withdrawn and the invaginated part disengaged; (*b.*) removal of the appendix, when the surrounding parts are in a state of inflammation; (*c.*) dissecting out of cysts which are fixed by the broad ligament. The general nervous system offers instances when many and large nerve-trunks are cut through almost simultaneously, as in amputation at the hip. The phenomena primarily affect the

vaso-motor centre, causing contraction of the terminal systemic arteries; and the respiration and the heart are both influenced secondarily in order to meet the new distribution of the blood.

III. A youth, aged twelve, was prepared for the operation of the removal of the appendix. He was a pale-faced but well-nourished boy, and his demeanour during the early period of the induction of chloroform-anæsthesia proved that he was subject to considerable alarm. Anæsthesia was effected in seven minutes, the pupil being pin-point; the operation was in progress up to the moment when the appendix was drawn out of the wound, the anæsthetic state of the patient having continued constant. Coincident with the displacement of the appendix, the complexion became blanched, the pupil, which had never varied, remaining pin-point. The pulse was, at this juncture, perceptible but very small; the breathing continued, but became, and very rapidly so, more and more shallow with each successive inspiration. At the end of the sixth inspiration, the pulse could no longer be felt at the wrist; and with the breathing now almost in a condition of arrest, the pupil began to dilate. The boy's head was then allowed to hang over the end of the table and the lower extremities raised; a finger was placed in the mouth and the tongue pressed forward, so as to prevent mechanical obstruction to the air-passage, for every muscle was now in a state of profound relaxation. In this new position breathing was gradually restored without any artificial help; the pupil immediately contracted, and with the improvement in respiration the colour returned to the cheeks, and at the end of fifteen seconds (approximately) from the lowering of the head, the pulse could be felt at the wrist. At the end of one minute the pulse and respiration having in the meanwhile resumed their normal characters, the boy was replaced on the table, and then it was noticed that he had perspired very freely. A mixture of chloroform and ether in the proportion of two and one was used for the ensuing five minutes, followed by chloroform alone. Care was taken to keep the lower jaw forward, so as to counteract any tendency to backward displacement. The operation was completed, and the patient made a successful recovery.

This is a characteristic example of vaso-motor faintness. And it is a complication very prone to be met with among neurotic subjects. The alarming rapidity of its progress stands out very prominently; but fortunately not all cases of vaso-motor faintness assume a like severity. The rule is that there is a greater or less interval, but not longer than ten minutes in

my experience, between the accession of the systemic circulatory disturbance and the depression of the vital forces to their lowest point. And it is during this interval that we may observe the manifestations of reflex stomachic phenomena, which are to be differentiated (1) from signs of sickness during returning consciousness; (2) from stomachic action during chloroform-anæsthesia. And here it must once more be remarked, that the onset of pallidity has nothing whatever to do with the heart. When opportunity is favourable, and the finger be placed over the apex, it will be noted that while the pulse is becoming smaller, the heart itself is beating with slightly increased vigour; but the blood being temporarily lost to the systemic circulation, this access of energy disappears, and the heart's action becomes proportioned to the reduced quantity of blood it has to propel. And for the same reason, the respiratory machine is sympathetically depressed, and may be momentarily arrested. It is well to observe the sequence of these phenomena with precision, otherwise the tendency is great to fall into the error of false causation; and also to note the intercurrence of particular respiratory phenomena, consisting in the varying inhibition of the movements of the diaphragm,—hiccough and attempts at vomiting: sometimes a little mucus is expelled. And it is just these phenomena, which are only part, and a minor part, of the main complication, which tend to bias our judgment, if we do not properly interpret them, and may therefore exercise a prejudicial influence on their treatment. They are indirect, collateral effects of a cause seated elsewhere, and not the immediate effects of direct stomachic action. And they owe their being to the proximity of the vaso-motor centre to the respiratory and vomiting centres. When these vaso-motor phenomena do not reach a severe degree, the only care to be taken is to keep the respiratory channel fully patent, by regulating the position of the tongue and jaw. Of course the amount of the anæsthetic is to be reduced to meet the new condition of respiration. But if danger be apprehended two things are necessary: the first consists in lowering the head and raising the legs, so that the blood in the upper great vessels shall be able to reach the medullary centres with the greatest ease; and the second, in being quite sure that no obstruction to breathing be offered by the tongue and jaw.

In vaso-motor faintness the greater part of the blood in the systemic passes into the portal circulation; and provided there are no inter-current complications, the redistribution of the blood takes place without any extraneous help, when the con-

ditions above stated are present. But if the position of the tongue and jaw be not efficiently maintained, if there be partial or complete obstruction to respiration, the untrammelled action of which is now of paramount importance to the recovery of the patient, death may occur (*a*) from syncope because the blood does not return with proper rapidity into the systemic circulation, and thus causes the failure of the heart's action, or (*b*) from asphyxia. What is the proper rapidity with which the blood should pass from the portal into the systemic circulation? This is defined by the unfettered natural action of the respiratory machine. Breathing has been depressed, and it can only return to its former state of proficiency (1) after the action of the stimulus which has caused the depression has ceased, and (2) when there is no obstruction to the entry of air. But would it be prudent to help the depressed state of respiration in its earlier stages by artificial means? If there have been no excess of chloroform present in the lungs, and the respiratory passages are normally patent, there should be no undue hurry. So long as gradual progress be made, Nature should be left to herself to effect complete restoration; each depressed function thus acts harmoniously with its neighbour by supplying its wants at the time, and these wants are gradually increased. As an organ recovers, so its neighbour follows; but if, the heart's action having been reduced to its lowest point, blood was violently returned to it by artificial respiration in such quantity as to stimulate it to great exertion, for which at the time it is not disposed after its period of diminished action, in my opinion harm would be created, and the interference to the natural progress of the cardiac function might end in its final arrest. Artificial respiration is only of use (1) when at the onset of the complication there be any doubt as to the presence of a relative excess of chloroform in the lungs; and (2) when in the course of recovery respiratory obstruction has been present, and perhaps unobserved. In this latter contingency the colour of the complexion would change from pallidity to lividity, and the pupil continue partially dilated. By restoring the complete patency of the air-passage, the first step is taken towards getting rid of the excess of carbonic acid in the blood. But before the blood becomes normally oxygenated there is an interval, and this interval is shortened by the judicious practice of artificial respiration. Thus the obstacle to the flow of blood to the heart is removed in the shortest possible time. And when the complexion approaches the normal colour, and the pupil becomes small, artificial means may be withheld.

But, as in the case of stomachic action, the objection is

brought forward that the patient is not sufficiently "under," as it is called, and the signs of sickness are put down to returning consciousness. So, in Example III., it may be said that the phenomena described could not take place provided the patient was properly made insensitive to the transmission of all stimuli by the action of chloroform. Again, it is a charge of error in administration, but it is a charge based upon assumption which experience proves to be erroneous. It is assumed the effect of chloroform—and the degree of action is not defined—is to prevent the transmission of stimuli, whether starting from the nerve-ends or from some part of the nerve-trunk. Now, experience teaches us that when anæsthesia is present, ordinary reflex action is by no means universally abolished. Because it is lost here or there by reason of a comparatively large blood-supply, as when incisions are made in the skin, it does not necessarily follow that the nerve-trunks, which have a relatively less blood-supply, are incapacitated from transmitting stimuli. The fact is they do so and with readiness, but only when the patient is in a state of anæsthesia. If, however, the action of chloroform be increased, if instead of anæsthesia, as determined by the contracted state of the pupil, the state of narcosis be induced, with the pupil varying in dilatation proportionately to the excess of chloroform present, then the capacity of the nerves to transmit and the nerve-centres to reflect stimuli is perceptibly diminished. Supposing a patient to be in a state of chloroform-narcosis; the effect of nerve-stimulation is dulled, and this achievement might be regarded as being itself beneficial. But if it cannot be arrested, the nerve-centres concerned must be affected more or less, and the phenomena described in III. occur in the ordinary course, but with less severity. Can the nerve-trunks and nerve-centres be paralysed by chloroform so as to prevent the transmission and reception of stimuli? Yes, by so overloading the blood with chloroform as to arrest their nutrition. But this means not simply an arrest of nutrition of nerves and centres, but arrest of nutrition of all tissues of the body. The achievement of this particular good, therefore, cannot be attained without at the same time bringing about a general harm which would without any doubt involve somatic death. Nerve-paralysis being thus out of the question, let us consider the general condition of the patient in whom chloroform-narcosis is induced in order to counteract as far as possible the effects of nerve-stimulation. The blood is dark, by reason of the excess of chloroform in it, and being without its normal amount of oxygen, it is in an unfavourable condition to carry on the nutrition of the body. The lungs are congested, and

with this state of congestion interfering with the interchange of oxygen in the alveoli with the blood in the capillaries, there is associated venous distension and distension of the right side of the heart. A delay, greater or less, according to the degree of narcosis, exists in the communication between the right and left sides of the heart, and respiration is laboured (1) by the increased amount of chloroform in the air-channels, which is necessary to bring about narcosis, and (2) by the congestion of the lungs. The position of the patient is one which is eminently adapted to prevent the free access of air into the lungs and to delay the transit of imperfectly oxygenated blood to the left ventricle. But these are the very conditions—the free access of air and the natural unimpeded passage of the blood from the lungs to the heart—that are essential to the immediate recovery of a patient from vaso-motor faintness. But it is allowed the degree of this complication is less intense when chloroform-narcosis is induced. However much or however little the difference, there must always be a transference of blood from the systemic to the portal circulation. And the whole question rests on the ease and rapidity with which this displaced blood is returned to its normal quarter. There is a mechanical obstruction at the lungs, but this need not necessarily be great enough to oppose its passage successfully, though it may be in conjunction with the depression associated with vaso-motor disturbance, and at any rate it will prolong the time it takes to reach the heart. The great danger lies in the change to which the heart is exposed. Its nutrition is already degraded by the impoverished state of the blood. Its function is already embarrassed by the abnormal distension of its right cavities. And it is now subjected to a further trial, a diminution in the amount of blood sent to the left ventricle, which is followed by a decrease in the imperfectly oxygenated blood supplied to its tissues. Is the heart placed by these means in a condition the most favourable to withstand the consequences of temporary derangement of respiration? Is it prudent to run such enormous risks in order to attain, if it be attained, a very doubtful benefit? In my opinion all degrees of chloroform-narcosis are dangerous, even when induced for a particular end (as I think erroneously), and allowed to continue until that end is gained. Experience proves that ordinary anæsthesia is sufficient to meet the demands of all operations, even the most severe. Out of 900 successive major operations in which chloroform was administered and anæsthesia constantly maintained, there were seven cases which manifested vaso-motor disturbance, and of these only two were severe, necessitating

just those remedies which are used in ordinary cases of faintness. But in addition, the patient being unconscious, means were taken to ensure the full patency of the respiratory passages. In none was there any interruption to a quick recovery, and provided that the complication be taken at its beginning, it is difficult to see how there can be any danger. The complication arises and it has to be dealt with, and it is my experience that in this, as in all other complications, those patients recover quickest and best who are at the time of their occurrence under the influence of the minimum or anæsthetic dose of chloroform.

The physiological explanation of the phenomena arising during constant anæsthesia, provided by the Examples I., II., and III., involve the medullary centres and the respiratory and circulatory systems. When the semi-digested food in the stomach is about to be expelled, an impulse is sent from that organ through the vagus to the vomiting centre in the medulla. This vomiting centre is in immediate relationship on the one side with the respiratory, and on the other with the vaso-motor centre. The stimulus affects chiefly the respiratory centre, and I have observed many cases in which suspension of respiration antecedent to the act of vomiting is the only phenomenon present. There is no alteration in the colour of the complexion; but the latter perforce becomes somewhat congested as the result of circulatory disturbance consequent on temporary respiratory arrest. Such instances show that the vaso-motor centre is inappreciably if at all affected from the quarter of the vomiting centre, and the temporary inhibitory stimulation of the respiratory centre does not proceed so far as to interfere materially with the vaso-motor system. But the larger proportion of cases of stomachic disturbance are associated with pallor, which may be more or less profound, and due solely to constriction of the terminal arteries, and especially when it is most profound it is apt to be mistaken for the chief phenomenon of the group comprising stomachic complication. But the true order of their succession in time is—1. Respiratory inhibition, more or less intense; 2. Vaso-motor constriction; 3. Secondary cardiac phenomena; 4. Sweating; and 5. Pupillary variations. If the error be committed of ascribing the chief place to vaso-motor disturbance in this complication, there will be a tendency to fall into an error of inference, and explain the pallor by some obscure action of the heart induced by chloroform. Chloroform in this style of reasoning is the enemy, despite the fact that up to the moment of the occurrence of the complication its effects had been quite constant, and that the well-defined group of phenomena disappear when the colla-

teral cause (acting during chloroform-anæsthesia) ceases, and never appear again during the continued administration of the anæsthetic.

But this false inference not only affects the true physiological explanation of the problem, it also leads to errors of treatment. The respiratory centre being first and principally affected by the complicatory cause, all our efforts are to be directed towards preserving as great efficiency of breathing as is possible under the unfavourable conditions. To this end the amount of chloroform is reduced in accordance with the altered state of the respiration. And our only concern is to see that there shall be no interruption to the harmony of the functions of the stomach and respiratory system when the act of vomiting is imminent.

In Example III. the chief phenomenon, and it is also first in order of time, is vaso-motor constriction. Reflex stimuli, generally from some part of the abdominal cavity, pass up to the vaso-motor centre, and its effects are transmitted to the terminal arteries. To meet this alteration in the vascular system, the respiratory centre is secondarily influenced, and also the cardio-inhibitory. For under the new conditions of the blood distribution (and the reduction in blood-pressure may be momentarily very great) there are required changes in the natural functions of the lungs and heart. Thus breathing and the heart-beat may be depressed to a very low degree of action. When vaso-motor faintness is less severe there are generally present reflex stomachic symptoms, which result from the central implication of the vagus nerve, and are to be differentiated from the direct variety. In the most severe instances, when the patient's forces are reduced to a stand-still, the head is lowered and the feet raised, in order to direct the blood by the action of gravity to the medullary centres; and the tongue and jaw are kept forward so as to allow of the complete patency of the respiratory passage. In the less severe forms a mixture of ether and chloroform, in the proportion of two and one, is efficacious in opposing the tendency to the decline in blood-pressure. The hiccough may be arrested by putting pressure on the diaphragm—the nostrils are gently compressed, and thus the patient is forced to take deeper inspirations through the mouth.

The part the heart plays in these complications is of a purely secondary character. Pallor may be present, though the heart may be striving to work with extra force; and all subsequent changes in its action are sympathetically induced to meet the primary disturbance either in the respiratory system

or circulatory. When this is profound, so is the ensuing cardiac change profound. But during the whole period of the complication the nutrition of the heart is practically unaffected (or affected in the minimum degree) by chloroform circulating in anæsthetic amount in the blood. If this amount be increased, and the state of narcosis induced, the nutrition of the heart suffers in proportion to the degree of narcosis present. It is in this way, and only in this way, that chloroform has a direct pernicious influence on that organ, but it is to be carefully noted that it is not a poisonous effect particularly confined to the heart, for it exercises the same effect on every tissue of the body. This dangerous result of chloroform can be avoided by limiting the sphere of its action. And the importance will be recognised of maintaining the patient in a constant state of anæsthesia, and free of those minor factors which might increase the gravity of the original complication, and which, if not dissociated from true chloroform effects, too often tend to obscure its proper action, and by misinterpretation lead to errors of practice.

THE STUDY AND DIAGNOSIS OF THE COMPLICATIONS OF SUPPURATIVE OTITIS MEDIA.¹

BY

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Examination of sections made through temporal bones reveals the thinness of the bony septum separating the middle ear from the temporo-sphenoidal lobe of the brain on the one hand, and the mastoid cells from the lateral sinus on the other. As these bony plates are perforated for transmission of vessels from the ear to the sinuses, and receive their blood-supply from the lining membrane of the middle ear and mastoid cells, it is easy to understand how disease of this lining membrane favours the spread of inflammatory and carious processes through them into the adjacent intracranial structures. By these processes the following complications may ensue :—

- (1.) Septic thrombosis of veins and sinuses, and
- (2.) Extradural abscess, both resulting in pyæmia.
- (3.) Intradural abscess and meningitis.
- (4.) Abscess of brain : (*a*) cerebral ; (*b*) cerebellar.

And in addition there also occur :—

- (1.) Facial paralysis.
- (2.) Hæmorrhage from internal carotid artery.
- (3.) Malignant disease.
- (4.) Septicæmia.

The observations to be made on the pathology and clinical features of these complications, more particularly of the first

¹ A thesis for the degree of M.D. in the University of Cambridge.

group, are based upon records of 300 cases, of which full statistical tables of 220 are appended.

The complications most commonly follow a chronic suppurative ear-disease, but may follow a primary acute suppurative otitis media, due to a specific fever, or to inflammation spreading from the pharynx by way of the Eustachian tube.

The symptom otorrhœa, often intensely fetid from the action of saprophytic bacteria, may have been continuous for years without intermission, or it may have been "off and on," as it is so commonly described. Sometimes absent for a considerable period, an acute attack of suppuration in the old diseased ear ushers in complications, and these secondary acute attacks must be differentiated from, and not confused with, the primary acute attacks previously mentioned.

The history of no discharge must not be accepted too readily as a true one, for when the disease has been quiescent for years, the patient may forget ever having been a victim of it, or, if it be present, and be not great in quantity, or particularly offensive, does not, from want of observation, appreciate its presence.

It is often difficult to tell, should a secondary attack have been in existence a few weeks, whether or not there may have been any previous disease, unless the destruction of the tympanic membrane is obviously incompatible with such a short history of discharge.

Of 100 cases of pyæmia, 6 were dependent on primary acute attacks, 3 with and 3 without thrombosis of sinuses, while in 17 the discharge had been present for a period shorter than one year, in some of these only a few weeks, and therefore not unlikely to have resulted from secondary acute attacks. In the remainder of the cases the duration of discharge varied from one to twenty years.

Of brain abscess, 9 cases followed primary acute attacks. Chronic discharges are painless, and the occurrence of pain is sufficient to call for careful watching, especially if associated with diminution of the discharge. Should this have ceased, and its previous presence be denied, some small amount of pus may be found about the meatus, or failing this, the nostrils applied close to the meatus may often appreciate the foul odour emanating from it, which is in itself sufficient evidence of unhealthy processes in the ear.

The pain is caused by blockage of the secretion by a polypus, granulations swollen by the increased inflammation, or it may be even an exostosis of the external auditory meatus.

It has to be diagnosed from neuralgia and hysteria, in some cases not an easy task.

In neuralgic pain, some cause, such as bad teeth, may be found, and the pain is felt in front, rarely behind the ear, though it radiates over the temporal region.

In a case under my own observation, three weeks before admission discharge appeared from the right ear, which had discharged six years previously. The absence of optic neuritis and symptoms of increased intra-cranial pressure, of tenderness about the mastoid, and the fact that the temperature, with one exception, never rose to 100° , and that the pain remained, though inflammatory swelling of the external meatus present on admission rapidly subsided, led to the diagnosis of neuralgic pain, in spite of the absence of sufficient cause. The chart was suggestive of cerebral abscess.

Hysteria presents equal difficulties in diagnosis.

Quite recently I saw a woman who three years previously had been trephined for a supposed cerebellar abscess. Nothing was found. When I saw her, there was extreme tenderness about the region of the old scars, and it was thought there might be some retention from the previous operation. While under observation for more than four weeks, the pulse-rate was usually 84, and there was old optic neuritis, but no indications of increased intercranial pressure.

There was an attempt at staggering gait, but it was obviously intentional, and the degree of pressure borne over the tender area varied considerably with the extent to which the attention was diverted by conversation to other matters. It was subsequently discovered that the woman's previous history was not devoid of hysterical element, and that she and a friend had been inmates together at the Hospital where she had been trephined, her friend being the victim of a cerebellar abscess which proved fatal.

This case illustrates the difficulties presented by, and the diagnosis of, hysteria.

The first question at the outset of any investigation of a case presenting symptoms referable to the ear is, Do these depend upon a strictly intracranial lesion following ear-disease, or are they caused by some other condition of the ear, or are they concurrent symptoms in an entirely different disease? Investigation of the local condition of the ear is of great value. A perforated membrane with discharge is indicative of present ear-disease. A perforated membrane without discharge may be due to—

(a.) Former ear-disease now absolutely quiescent, presenting no symptoms, and therefore excluded at once.

(b.) Chronic ear-disease in which discharge has recently

ceased after being present; here some slight discharge or odour is usually discovered on careful examination.

(c.) Chronic ear-disease in which destruction of the lower half of membrane has occurred, and the lower margin of the upper half hanging loose has formed adhesions to the promontory, effectually preventing any escape of discharge from the middle ear. This is a rare condition, and apt to be puzzling, unless the remaining upper portion of the membrane bulges, and an incision gives exit to the retained secretion.

When these two latter conditions are present in addition to obvious cerebral symptoms, and independent diseases have been excluded, such as enteric fever (for diagnosis see later), it is very probable that intracranial complications have or are about to set in.

An unperforated membrane does not exclude these complications, as they occasionally occur with such a condition, and even after primary inflammation of the mastoid cells, the middle ear being entirely free from disease.

With an unperforated membrane two conditions may be present.

(1.) Acute suppurative otitis media, distending the middle ear with pus, producing bulging and redness of the membrane, an incision of which quickly relieves symptoms due to it, namely, headache, vertigo, vomiting, a rigor, or a convulsion if the subject be a child.

(2.) No distension of the middle ear, but the membrane showing evidence in greater or less degree of a previous rupture with a subsequent healing. Due weight must be given to this condition, for behind such a membrane inspissated pus or cholesteatomata in the tympanic cavity or mastoid cells may contain the seeds of a fatal termination, that have long lain dormant, but roused to active life by some slight cause, such as a blow on the head or ear, exposure to cold and wet, or undue force and carelessness in syringing the external meatus.

Again in old people the cause of vertigo and vomiting may be overlooked, unless the pearly condition of the tympanic membrane, denoting commencing ankylosis of the malleus, be appreciated by a direct inspection of the external auditory meatus.

Pain with diminution, or entire cessation, of discharge in chronic ear-disease cannot be over-estimated as an indication of danger. A glance at the statistical tables (p. 188) shows that the complications of otitis media are commoner on the right than on the left side. This is in accordance with the results of other observers. On what factors does this depend?

The incidence of suppurative otitis media after fevers is about equal on the two ears, excluding at once the primary suppuration as the cause. Korner, from measurements of skulls, makes the sigmoid fossa on the right side lie anterior to that on the left, and ascribes the commoner occurrence of complication on the right side to this anatomical condition.

Barker suggests it may be due to bad drainage and exposure to the atmosphere, from more individuals sleeping on the left than on the right side. This suggestion appears hardly adequate.

The right lateral position during sleep was appreciated long before our own times, for Pliny, implying a position of security, has "*in dextram aurem dormire.*"

From inquiries on this point, I find the majority of individuals prefer to sleep on their right side, and I have always been given to understand that this was due to the fact, that the liver being on this side, the right lateral position in recumbency is more comfortable than the left.

The left ear should therefore suffer more than the right, and the complications be commoner on the left side. This, however, is not the case.

Admitting the anatomical grounds of Korner may be a factor in the case, I bring forward the following suggestion as sufficient explanation of it.

In the majority of skulls the superior longitudinal sinus is continued forwards into the right lateral sinus, which is larger than that on the opposite side, and carries through it a greater flow of blood. The cavernous sinus empties itself mainly into the superior and inferior petrosal sinuses. The latter does not come into the question as much as the former, first, because it is not in such near relation with the middle ear, and secondly, because it empties its blood into the internal jugular vein, and not into the lateral sinus. The superior petrosal sinus, receiving radicles from the middle ear, runs backwards and outwards, and empties itself in a direction almost directly opposed to the current of blood at the junction of the horizontal and sigmoid portions of the lateral sinus.

The flow of blood being greater through this channel on the right than on the left side, the outfall from the superior petrosal sinus is relatively retarded to a greater extent on the right side, causing a relatively increased congestion of the venous system of the middle ear on this side. Consequent on this congestion there is a deficient supply of arterial blood, resulting in a decreased recuperative power in diseased tissues, and diminished resistance to the unhealthy processes already pre-

sent, which therefore have facilities for extension on the right side, which are not present to the same extent on the left.

Further, in the right lateral recumbent position the direction of the sigmoid portion of the left lateral sinus becomes more vertical, thus facilitating the outfall of blood from the left superior petrosal sinus into the left lateral sinus, whilst the effect of gravity will tend to lessen the outflow from the left cavernous sinus into the left superior petrosal sinus, increasing in corresponding amount the flow into the opposite cavernous sinus by way of the circular sinus. The whole tendency of gravity will be to increase the congestion of the right side of the head, whilst an additional obstacle to the removal of this increased blood will obviously be present in the change in direction of the sigmoid portion of the right lateral sinus, for in the upright position its direction is downwards and forwards, while in the right lateral recumbent position its direction is upwards and forwards.

The change in direction of the horizontal portions of the lateral sinuses will also add to the same result, for the horizontal portion of the left lateral sinus becomes directed upwards, retarding the flow of blood in it, and tending to make more pass by way of the right lateral sinus, and this increased quantity, though appearing to benefit by the now downward course of the horizontal portion of the right lateral sinus, in reality does not do so, for the jugular bulb and the point where the superior longitudinal sinus becomes the right lateral sinus are very nearly on the same horizontal plane.

Chronic ulcers of leg, deprived of arterial blood by constant venous congestion in the dependent position of the limb, refuse to take on healthy action, but when the limb is raised to decrease the venosity, and thus increase the arterial blood-supply, healing quickly supervenes. In the same way I think the relatively increased venosity of the right side of the head, as above shown, is amply sufficient to account for the preponderance of complications on the right side.

In 13 cases of otorrhœa present at the same time in both ears, the complication pyæmia resulted from the right ear 7 times, from the left 4 times, and in 2 cases the side on which complication occurred was not stated (see Tables II., VI. c., and X., pp. 188-190).

Interference with the flow of blood through the right sinus causes greater cerebral disturbance than interference with that through the left, for ligature of the internal jugular vein on the right side, the sinus not being plugged, not uncommonly produces temporary blueness, or it may even be severe collapse,

circumstances rarely observed on ligature of the left internal jugular. Plugging of the sinus by thrombosis would have some result on the circulation, but as probably it would be only temporary, it would not have much effect on the relative death-rate of the two sides; and on analysis I find that where thrombosis was induced by operation or occurred spontaneously in the sinuses, 26 deaths occurred in 51 cases on the right side, while 20 deaths in 40 cases on the left, the relation of deaths to recovery being practically the same on the two sides (see Table V., p. 189).

PYÆMIA—EXTRADURAL ABSCESS—THROMBOSIS OF LATERAL SINUS.

These three conditions must be considered conjointly, for the recognition of either the second or the third will sometimes depend almost entirely on general pyæmic symptoms.

In the class of 100 cases of pyæmia, I consider as far as possible only pure cases of pyæmia and thrombosis, excluding entirely any cases of thrombosis of sinuses associated with cerebral or cerebellar abscess. Meningitis, associated with thrombosis, is always secondary to that lesion, and death is often due to it, so that it cannot be entirely excluded. It occurs late, and the modification in the symptoms due to it, as well as those due to the presence of cerebral or cerebellar abscess, will be considered later.

Of the 100 cases of pyæmia, 15 had no thrombosis of any sinus. In 4 of these 15 the symptoms were due to pyæmia dependent on an extradural abscess.

In 10 cases there is not sufficient evidence to show whether or not thrombosis was present.

The remaining 75 had thrombosis of varying extent, 61 showing thrombosis of lateral sinus only, and 14 thrombosis of that channel together with thrombosis of other sinuses. (For details see Table I., p. 188.)

In the 15 cases without thrombosis of the lateral sinus, what was the source of pyæmic infection? The naked-eye appearances vary. Small veins run from the ear into the lateral and petrosal sinuses, and thrombosis of these can easily take place consequent upon inflammation of their coats. When these veins are rather larger than usual, their thrombosed condition can actually be demonstrated post-mortem, unassociated with thrombosis of sinuses; and when they are small it is not difficult to understand how easily they may be missed in an autopsy, and much more so thrombosis of minute radicles, or it may

be septic osteomyelitis of bone round the ear, conditions almost requiring a microscope to demonstrate their actual presence. In well-marked cases the bone oozes pus on section. However small the thrombosed channel, it is quite sufficient to set up pyæmia if the detached portion of the thrombus be septic.

In other cases, a minute thrombus may be in the petrosal sinuses, or sometimes nothing is discovered post-mortem except a small roughened area on the wall of the lateral sinus, perhaps no larger than a split pea, but obviously the source of infection.

The roughened area may be the result either of extension from without inwards of an extradural abscess, or of inflammatory changes spreading by continuity along the inner coat of a small vein opening into the lateral sinus. Mere shedding of the inner lining is quite sufficient to produce this condition, and as soon as it occurs, the physiological relation between the blood in the sinus and the sinus wall is changed into a pathological one, the change being aided by the naturally slow current in the sinus.

In other cases the sinus wall appears natural, but the roughened area is in the jugular bulb, or commencement of the jugular vein, probably started by infection from the inferior petrosal-sinus or a small vessel from the middle ear emptying themselves into the vein, or possibly by extension of inflammation through the coats of the vein from surrounding lymphatics.

In those cases of pyæmia recovering without operation it is impossible to say what the condition was during the pyæmic state. With absence of indications pointing to undoubted thrombosis of the lateral sinus, there was probably a thrombosis of minute radicles or of the smaller sinuses, or possibly a condition of partial thrombosis of the lateral sinus or internal irregular vein quite close to the jugular foramen, with non-obliteration of the channel.

That thrombosis of the lateral sinuses is compatible with the recovery of the patient is certain, for it is not very uncommon to find post-mortem the lateral sinus obliterated by old thrombosis from the torcular forward to its termination, or to a lesser extent, as the result of chronic ear-disease on that side. I have myself seen three specimens of this. Whether or not this was a septic thrombosis cannot be conclusively proved at present. That it may have been can be well understood from the following considerations:—

(1.) That cases of pyæmia do recover without surgical interference.

(2.) That cases recover with surgical interference, the exposed portion of the lateral sinus appearing healthy, and therefore not

artificially obliterated at the operation. There may have been partial thrombosis existent outside the area of operation.

(3.) That where the lateral sinus was found by operation to be thrombosed, or thrombosis was induced by ligature of the internal jugular vein and the clot not removed, complete recovery has taken place, there being reason in some cases to believe this clot to have been septic, as when the floor of an extradural abscess, formed by the outer wall of the sinus, was in such a sloughy condition that the exact situation of the sinus could not be accurately ascertained.

(4.) That when a septic thrombosis of the sinus has arisen from an extradural abscess originating from the mastoid cells by spread of inflammation from the middle ear, and the pus of the broken-down thrombus is retained by healthy thrombus at either end, the outer sinus wall may slough, and allow of discharge of its contents into the extradural abscess, which, forming a communication with the mastoid cells, empties itself through these into the middle ear out and through the external auditory meatus, the cavity subsequently healing by granulation. An alternate route for discharge is through the mastoid foramen. Some of these discharges may formerly have been considered as cases of brain abscesses opening externally.

In very acute cases of pyæmia, rapidly terminating in death, no cause can be appreciated by the naked eye. It would seem as if these cases are due to implication of the minute radicles round the ear, and that a shower of infection thrown into the general system is sufficient to cause death before further thrombosis has had time to take place, limiting and retaining the septic matter by a more healthy clot. Evidence of the importance of this protecting thrombosis is that pyæmic symptoms are occasionally almost absent when the pus is retained within the sinus by a buffer, as it were, of healthy clot at either end. This subject is discussed in detail later.

EXTRADURAL ABSCESS.

For the satisfactory elucidation of symptoms, it is necessary to enter into detail with reference to the pathology of this affection.

Extension of inflammatory and carious processes from the middle ear give rise to an inflammation of the dura and meninges. Should these be limited and not reach the formation of pus, the result is a limited inflammation of the dura tending to resolution. The symptoms of this will depend on the extent of the inflammation, its situation, and the amount of irritation

experienced by the underlying cortex (see Meningitis, p. 152). Should the inflammation advance, an extradural abscess will be formed, which may make its way in various directions, or, instead of spreading between the dura and bone, will give rise to a brain abscess by direct extension, provided the plastic exudation at its margins be sufficient to prevent spreading along the meninges, with rapid death. Another method of formation of an extradural abscess is by spread of inflammation from a thrombus in the lateral sinus.

The commonest situation for an extradural abscess is in the sulcus lateralis, originating from the mastoid cells, or from necrosis of the posterior part of the temporal bone, either immediately over the sinus or above it, with subsequent spread downwards.

It may then—

- (1.) Set up meningitis of the posterior fossa.
- (2.) Involve the lateral sinus, with the possible later production of cerebellar abscess.
- (3.) Discharge externally by erosion through the mastoid bone itself, or through the occipito-mastoid or parieto-mastoid sutures, especially before the age of five, while the sutures remain unossified, or else through the foramen for the mastoid emissary vein, or through the mastoid cells and out at the meatus. These paths are not common, and obviously offer greater resistance than extension inwards to the meninges and brain.
- (4.) In addition to involving the lateral sinus, the abscess may also spread upwards and anteriorly over the posterior edge of the temporal bone, with the possible production of a temporo-sphenoidal abscess—one explanation of the occurrence of a temporo-sphenoidal abscess with thrombus of the lateral sinus.

The next commonest situation for an extradural abscess is over the roof of the tympanum, formed by extension of carious processes upward. The pus may then—

- (1.) Spread backwards and outwards, perforate the lateral sinus, and at the same time produce a temporo-sphenoidal abscess by extension upwards.
- (2.) Spread outwards, stripping the dura mater off the temporal bone, even the ascending squamous portion, soaking the bone in pus and setting up extensive caries.
- (3.) Produce meningitis before the preceding changes take place.

Since extradural abscess is commonest in connection with the sulcus for the lateral sinus, and gives rise to thrombosis of that vessel, it is evident that the symptoms of the former are

often the commencement of those of the latter, and that they will merge one into the other.

It is not common to find an uncomplicated case of extradural abscess resulting in death (borne out by the post-mortem examination) from which to obtain the symptoms it produces, as the condition usually rapidly extends, either to the meninges when meningitic symptoms predominate, or to the lateral sinus when the symptoms run into those of this lesion. Another obstacle to obtaining the symptoms is that cases come into hospital when the meninges or the lateral sinus are already involved, and we do not see the commencement of the illness, and the accounts of the parents are of little value against the trained observations of hospital workers.

I see no reason to believe that extradural abscess is often secondary to other complications, but rather the reverse, so that the beginnings of meningitis and lateral sinus thrombosis give us the best indication of its symptoms.

A minute extradural abscess, a mere drop or two, presents the symptoms of retained pus. There will be a sudden onset, with a rigor and high temperature, the subsequent course of temperature depending on how the abscess proceeds. If progressing slowly, a fall will follow the initial rise, followed by subsequent slighter rises to 100° . Rapid pulse, vomiting, and flushed face may all be present. As the abscess increases, the area for septic absorption becomes greater, and pyæmic symptoms predominate, with rigors and sweating. In the only uncomplicated cases of extradural abscess with a fatal ending that I have found, the symptoms were pyæmic. The course of the temperature and the rigors are discussed later.

By extension more of the meninges suffer irritation, and deep-seated pain and tenderness will be complained of, with an inclination to drowsiness, not from increased intracranial pressure, but rather from the pain having a tendency to keep the patient quiet, lying with closed eyes, and objecting to any outward interference, even light, as all conducive to movement and increased pain.

Local indications will depend on its situation and size. A drop of pus may give no indications of its presence.

If above the tympanum, pain in front of the mastoid will be likely to indicate it, whilst in the posterior fossa pain behind the ear may be complained of, although often the pain is not local, but general about the region of the ear.

Tenderness on pressure may aid, and more so as the abscess increases. If above the tympanum, and it spreads outwards, tenderness on pressure may be elicited in the temporal region

above the condyles of the lower jaw, the area of tenderness increasing upwards, backwards, and to some extent forwards, according to the spreading of the abscess.

Tenderness ought not to be waited for, as it indicates also meningitis. If the abscess is in the sulcus lateralis, tenderness will be elicited along the posterior, and to some extent the superior border of the mastoid, apart from the central condition of that bone; for tenderness, redness, and œdema here are rather indications of pent-up pus in the mastoid cells, which is itself a predisposing factor in the formation of extradural abscess in the posterior fossa.

The formation of an abscess externally at the posterior border of the mastoid may result from an extradural abscess discharging through the foramen of the emissary vein, but abscesses over the mastoid are nearly always due to extension from the mastoid cells.

The possibility of such a condition shows the importance of opening at once all abscesses over the mastoid, for should pus be seen coming through the foramen, it is an evidence of supuration in the sulcus lateralis, and an immediate call for extension of the operation to admit of its evacuation, and diminish the risks of its intracranial spread. And should the emissary vein be found plugged, it is an indication that thrombosis of the sinus has taken place, secondarily or otherwise to the formation of an extradural abscess.

SEPTIC THROMBOSIS OF LATERAL SINUS.

Thrombosis may result in various ways.

(1.) As the result of extradural abscess in the lateral sulcus, with extension of clot.

(a.) Backwards towards the torcular, even into the opposite lateral sinus, the superior or inferior longitudinal, or straight sinuses.

(b.) Downwards into the internal jugular vein, reaching generally about half-way down, but in some cases extending into the innominate vein, or even into the superior vena cava.

(c.) Inwards into the superior petrosal and cavernous sinuses of that side, with possible extension to the opposite sinuses by way of the circular sinus.

(2.) By extension of thrombosis from veins into the superior and inferior petrosal sinuses, and so into the lateral sinus.

(3.) By thrombosis commencing in the jugular vein and extending upwards into the lateral sinus, either spontaneously or after ligature of the vein.

When formed, and especially when dependent on extradural abscess, the thrombus breaks down in the centre opposite the abscess, the pus, or it may be even foul gas, thus formed being at first shut off from the venous channels by more healthy clot. Clot once formed has some tendency to spread, because the walls of the sinus in the region of the abscess have been injured, either by the contiguous inflammation or by adhesion of septic material after it has been thrown off into the circulation.

Extension of the breaking-down process along the length of the clot lets loose septic material into the adjoining fluid blood, either in the sinus or in the jugular vein, the pointing of the extremity of the clot in the latter situation favouring throwing off of broken-down thrombus into the blood between the wall of the vein and the pointed clot. This pointed extremity of the clot in the internal jugular vein is not always septic, and the infarcts produced by detached portions of it resemble those resulting from endocarditis in having no tendency to break down.

If the thrombus has formed without the previous existence of an extradural abscess, the breaking-down process and inflammation of the wall will involve the meninges if the visceral side of the sinus be most involved, or may produce an extradural abscess, with some bony change if the outer wall of the sinus suffers.

The symptoms usually described as typical of septic thrombosis of the lateral sinus are:—

(1.) Sudden onset. Pain in the ear and radiating over side of the head, vomiting, rapid pulse, and a rigor.

(2.) Rigors, repeated with sweatings. They vary in number and frequency, and are either absent or replaced by convulsions in children. They are accompanied by high temperature.

Occasionally they appear with a low temperature, but it rises after the rigor has passed. In one case they were preceded by action of the bowels.

(3.) Flushed face.

(4.) Oscillating temperature, rising high with the rigors, and falling again to normal or below. The ranges of temperature are often very well marked: in one case the temperature passed from 106° to 96.6° in twelve hours.

The highest temperature with recovery I can find is 108° , the highest with death 109.2° .

(5.) Optic neuritis.

(6.) Rigidity of neck muscles with pain, and sometimes retraction. The pain occasionally extends down the back, apart from any spinal meningitis.

(7.) Indication of ear-disease.

(8.) Tenderness.

(a.) At the posterior border of the mastoid and along the sinus.

(b.) Down the neck along the course of internal jugular vein.

(9.) Repeated vomiting—sometimes entirely absent.

These are sufficient for the diagnosis of a typical case.

Of these symptoms the condition of the ear has already been dealt with. Optic neuritis in the diagnosis of the complications will be specially discussed.

The onset, rigors, and temperature chart are considered later.

The tenderness down the neck may be due to the following conditions:—

(a.) Inflamed lymphatics along the vein and anterior border of the sterno-mastoid, with some induration and fulness of the neck, differing to the touch from that due to thrombosis of the vein, uncomplicated by so much lymphatic swelling.

(b.) Inflammation of the vein itself without thrombosis, this condition appearing post-mortem as a roughened interior of the channel, with or without discoloration, generally greenish or yellowish, and infiltration of its coats.

(c.) To thrombosis extending into the vein. If this be appreciated before subsequent induration supervenes, a distinct cord is felt along the course of the vein, from the angle of the jaw to a variable distance down the neck.

As a result of these conditions the corresponding side of the face may be more flushed than the opposite, and from obstructed venous return the veins of the eye fuller on the same side.

Owing to the obstruction to the return of blood by the internal jugular, the circulation is carried on by the anterior and external jugulars, which are therefore fuller on this than the opposite side.

One observer also gives as an important symptom due to lateral sinus thrombus, the deficient filling of the external jugular vein on expiration (Gerhardt). The tenderness is usually most marked high up, because the pathological condition has here advanced to a greater degree than lower down; and this tenderness and induration may progress to the formation of an abscess, as follows:—

(1.) By suppuration of the inflamed lymphatics.

(2.) By thrombosis of the vein, with subsequent breaking down of the clot, sloughing of the wall of the vein, allowing pus to gain access to the tissues of the neck. The pus may

then produce a localised abscess, or tracking down the fascial planes of the neck, enter the anterior mediastinum—an absolutely hopeless condition.

(3.) By tying the vein and leaving the clot *in situ*. An abscess is occasionally formed in this way, though sometimes resolution occurs without its formation.

(4.) By pus tracking downwards along the sheath of the vein from an extradural abscess in the sulcus lateralis.

An abscess may also be formed in the splenius capitis or other posterior cervical muscles, by tracking of pus from the lateral sinus through the posterior condylar foramen into the venous plexus situate here. The rigidity of the neck muscles mentioned as a symptom can be explained in two ways.

(a.) By any movement causing pain, from the fact that the trapezius, sterno-mastoid, &c., take their origin from the superior curved line of the occipital bone, which lies almost directly opposite the inflamed or thrombosed lateral sinus.

(b.) By extension of thrombosis through the posterior condylar foramen into the plexus of veins. Any recently thrombosed vein is tender, and therefore any movement of the head causes muscular pressure on this vein, producing pain, sometimes very acute.

A very occasional symptom is present in œdema of the temporal region. As pointed out by Moos, this depends on the presence of a petro-squamous sinus opening at one end into the lateral sinus, and at the other inosculating with the deep temporal vein through a persisting foramen jugulare spurium, which is present in early foetal life, closing as development proceeds. Zuckerkandl found this sinus present in 22 out of 280 skulls, but the foramen was present in only three, so that the symptom becomes a rare one. Œdema, due to necrosis of the temporal bone, must of necessity be excluded prior to accepting the condition as evidence of thrombosis of the lateral sinus.

Œdema over the mastoid is variable in occurrence. The tenderness at the posterior and superior borders of the mastoid, especially if the central portion be not involved, is a most important indication of thrombosis of the lateral sinus, and it may be present along the course of the sinus right up to the occipital protuberance, but it is most marked just at the posterior border of the mastoid, and is due to inflammation having extended to the mastoid emissary vein, or in event of the absence of this, to the numerous small veins passing through the masto-occipital sutures, which take the place of the emissary vein in its absence.

Tenderness generally is not of so much value in children from the difficulty of real localisation.

As the case proceeds, pyæmic complications become pronounced, provided of course the conditions be such as to allow of the dissemination of infective material into the general circulation.

Usually the lungs suffer first, and pleurisy, with or without effusion, empyema, septic pneumonia, localised abscesses from breaking-down infarcts, gangrene, and pneumo-thorax, may all occur.

Often the first sign of lung implication is the expectoration of rusty sputum, often tinged a little brighter than the typical sputum of pneumonia, and sometimes accompanied by a localised pain in the side. In fact, the first complaint may be of this pain, physical signs soon following; but it is often impossible to discover any physical signs in association with this sputum, and it may gradually disappear without signs becoming apparent. It may be when this occurs that small infarctions of the lungs have taken place, possibly from washing off of small portions of the pointed end of the clot in the jugular vein, which, being healthy, have no tendency to break down, but rather to resolve; whereas, if they be septic, the sputum becomes muco-purulent, foul smelling, and increased in quantity.

The spleen is usually swollen, though abscesses in it and in the liver appear to be rare. I have only found one hepatic abscess, and three cases of splenic infarction (one abscess).

Multiple abscesses occur about the body now and then, in some cases picking out the joints, and in other cases the subcutaneous tissue. It is a curious coincidence amongst the cases I have collected, that where abscesses occur about the body or in the abdominal viscera, the lung symptoms are practically in abeyance, and in addition thrombosis of the lateral sinus is often absent.

It would appear that in thrombosis of the sinus portions of clot containing infective matter are washed off which are too large to pass through the lungs to give rise to abscesses elsewhere, while should the small radicles about the ear be thrombosed the shed portions are so minute as to be able to avoid the filtering action of the lungs, and to give rise to secondary abscesses in other situations. Pericarditis occasionally occurs, but it is not nearly so common as lung complications.

Jaundice occurs late, appearing first as yellow conjunctivæ and a sallow look. Pyæmic spots are occasionally met with. I saw them in two cases. One of these was under my own observation, and at first I mistook the spots for flea-bites inflicted

previous to admission, as they resembled those seen in children and adults who are habitually attacked by these pests, and therefore more or less insusceptible to the bite, the urticarial condition being absent whilst the puncture remained surrounded by a small area of hyperæmia. The first diagnosis was proved erroneous by a fresh crop of spots of a more purple colour appearing daily, with fading of those previously present, by the spots being generally distributed all over the body, even over the fingers and toes, which as a rule are not attacked by fleas, and by the exclusion of these pests as a cause.

The intellectual condition shows some variations.

Drowsiness is the most general condition, occurring twenty times, associated with dulness, stupidity, irritability, wandering, or photophobia.

Delirium is mentioned in 18 cases and appears at two stages, at the commencement of the attack or towards the end, due in some of the latter to meningitis secondary to the thrombosis.

Intolerance of light is occasionally present, amounting to complete photophobia in eight cases.

All these conditions are of short duration, not extending throughout the whole course of the case, and may alternate one with another. In some the intellect remains unnaturally bright even to just before death.

Answers to questions are given rationally and without hesitation, in marked contrast to the condition in cerebral abscess.

The Pulse.—In uncomplicated cases it ranges from 60-80. Progressive increase in frequency, with a similar condition of the respiration, is a common occurrence before death.

Lung complications and multiple abscesses increase the frequency, and sometimes without apparent cause it varies greatly during the twenty-four hours.

A marked rise sometimes accompanies the increase of temperature after rigors (168 with a temperature of 107°, in an adult), but occasionally during rigors it does not rise above 85-90.

Respiration varies with the pulse, and large involvement of the lungs increases the rate, even as high as 76 per minute (child aged two with gangrene of lung), but involvement of the lungs is not necessary for this frequency, for in an adult aged twenty-four the respiration rose to 86, exhibiting the Cheyne-Stokes character, nothing pathological being found post-mortem in the lungs. The pulse in this case was not mentioned as having risen above 144.

Cheyne-Stokes respiration appears in four cases (two recoveries, two deaths).

One case had remarkable periods of apnœa, the intervals between the series of respirations amounting to as much as 40 seconds, the number of respirations in each series being 20–30. The patient recovered in spite of having convulsive seizures on the side of the body opposite to that of the ear-disease.

The urine often has a trace of albumen in it, due to some amount of nephritis, and in two cases chlorides are mentioned as present in abundance. One of these had abscesses in the lungs, but in the other no definite signs of lung involvement, though some cough.

Pupils in nearly every case are equal and react. In a large proportion of cases there is no mention of their condition. In only two cases was one greater than the other; in one of these, on the side of the dilated pupil, the cavernous sinus was blocked, and in the other the curious periods of apnœa were present, and the convulsions were on the side of the larger pupil.

Difficulty is often experienced in determining whether the symptoms be due to suppuration in the mastoid cells or to septic thrombosis of the lateral sinus.

There are a few points of distinction between these two conditions.

(1.) The tenderness or cedema over the mastoid, when pus is retained in the mastoid cells, is situated over the centre of the bone, while in thrombosis it is at the posterior border of it. It must be remembered that the mastoid condition will depend to some extent on the structure of the bone itself, for if it be sclerosed tenderness may be absent. Tenderness down the neck would indicate thrombosis.

(2.) Rigors are more frequent in thrombosis.

(3.) Presence of optic neuritis is in favour of thrombosis.

(4.) Slow pulse is against pus retention.

(5.) Actual vomiting at the onset is a little in favour of thrombosis. A rigor at the onset, photophobia, or drowsiness may be present in either. An additional aid to diagnosis in doubtful cases has been pointed out by Bennett, that leeches give relief in suppuration in the mastoid cells, but not in thrombosis of the sinus. The cases in which I have seen them applied, and hospital records, both tend to bear out this statement.

Additional Symptoms.—Should the thrombosis spread into the cavernous sinus, we get symptoms additional to those due to the pyæmia.

The spreading of the clot blocks the cavernous sinus and obstructs the venous return. The clot may spread into the

ophthalmic vein. Inflammation may involve the nerves running in the walls of the cavernous sinus. We shall get the following signs and symptoms:—

(a.) Proptosis—from (i.) Obstructed venous return; or (ii.) Pus in the orbit.

(b.) Edema of eyelids and surrounding parts, with chemosis and injection of the conjunctivæ if the ophthalmic vein be blocked.

(c.) Possible enlargement of the frontal vein, due to a change in the direction of the circulation through the orbito-facial anastomosis.

(d.) Edema of the face should the thrombosis extend into the facial vein.

(e.) Paresis or paralysis of third, fourth, or sixth nerves, separately, conjointly, or two together. Pain from irritation of the first division of the fifth in the area of its distribution may also be present.

The thrombosis in the ophthalmic vein may progress to the formation of pus, and the orbit be filled with it, pushing the eyeball forwards, and perhaps eventually leading to the loss of the eye. The facial vein may also be felt thrombosed before it is hid by the swelling which follows it, and this thrombus may also give rise to an abscess.

Should the thrombosis spread to the opposite cavernous sinus, this side becomes involved in a similar manner, and when the two are affected simultaneously the result is striking.

In the course of lateral sinus thrombosis we sometimes meet with some amount of temporary swelling of the eyelids, with chemosis of the conjunctivæ, but no other symptoms, possibly indicating a partial thrombosis of the cavernous sinus with rapid resolution.

Cases present the following clinical types:—

(1.) Pyæmia, with well-marked ranges of temperature, rapid pulse, chest symptoms little or not at all marked, gradual exhaustion, incontinence of urine and fæces, death.

(2.) Characterised by the predominance of chest symptoms.

(3.) The abdominal type, abdominal symptoms predominating, and to some extent simulating enteric fever.

The abdomen is rather full, tympanitic, and tender on pressure, with gurgling in right iliac fossa, and enlarged spleen, but differing from typhoid in the absence of spots.

Constipation or offensive diarrhoea may be present, the stools in the latter condition bearing some resemblance to those of typhoid, being yellow and liquid.

This diarrhoea seems to be due—

(1.) To catarrh of the mucous membrane, set up by the poison thrown into the system, the frequency of the stools being an apparent effort to get rid of the poison.

(2.) The catarrh set up by swallowing the abundant putrid sputum, as it appears when lung symptoms are well in evidence.

The diarrhoea is sometimes started by the exhibition of purgatives to counteract preceding constipation. The stools may also be frothy or grass-green in colour.

Enteric fever may be complicated by otorrhoea. Acute otitis media may supervene during the progress of the fever, and run its course independently of it, producing ruptured membrane and subsequent chronic disease, involving the possible dangers of future intracranial complications. Enteric fever may attack a patient the subject of a chronic ear-disease, and run its course as if the latter were not present.

The absence of otorrhoea in some cases of pyæmia makes the diagnosis difficult, and it is only the appearance of the typhoid eruption which makes the case clear. The eruption described as typical of enteric, viz., rose-coloured, lenticular, fading on pressure, and coming out in crops, may occasionally be present in cases of brain abscess and meningitis, but not in pyæmia.

Murchison says, "In patients who have otorrhoea enteric fever may commence with rigors."

In typhoid the rigors are never so repeated as in pyæmia, and the temperature chart differs as the fall of the temperature after rigors reaches the normal or below in pyæmia, but does not do so in enteric.

Murchison also adds, "Enteric is excluded by a temperature approaching normal on any evening during the first week, and, on the other hand, by a temperature of 104° on the first day or second morning." Exceptions to this do, however, occur.

The skin is moist in pyæmia and dry in enteric. Epistaxis occurs in both. Ehrlich's reaction I do not think would be of much service in the diagnosis, as it is not given till after the first week, and an earlier diagnosis than this is often wanted in sinus thrombosis.

It has occurred to me that in some cases of enteric ending fatally by pyæmia, the latter may have been due to the ear-disease, perhaps overlooked, and not to the focus for infection presented by the ulcerated surfaces in the intestines. It might be possible to differentiate these two causes of the pyæmia, for in that occurring from the ear secondary foci will be plentiful in the lungs, and in the other case in the liver.

In only one case did an abscess occur in the liver as the result of ear-disease, and the presence or absence of tenderness of the liver and of lung symptoms may therefore assist in the diagnosis.

RIGORS AND TEMPERATURE CHART AND THEIR INDICATIONS.

A case of pyæmia admitted to St. Bartholomew's Hospital on August 1, 1893.

The onset had been sudden on July 21st, and there was a history of repeated rigors. They occurred after admission up to August 11th. Operation was performed on that day. The lateral sinus was opened after evacuation of an extradural abscess lying over it, and the internal jugular vein was tied. The sinus was not thrombosed, and hæmorrhage was restrained by plugging. After the operation the temperature fell, and there were no rigors till the 15th, and at the same time there was great improvement in the patient's condition.

On 13th there was pain in the side and impairment of percussion at the left base, and from the 15th a series of rigors occurred, the chest signs having increased, pericarditis, pneumonia, and empyæmia following.

The patient ultimately recovered.

The chart in this case may be read as follows:—

The rigors before admission, and those from August 1st to 11th, were due to a continuous source of infection, for an extradural abscess was found at the time of the operation, and there may have been some thrombosis of minute veins about the ear, or a roughened area on the wall of the lateral sinus. Plugging of the sinus by operation and ligature of the internal jugular vein cut off the supply of infective material, with a temporary cessation of the rigors, but not before some infection of the lungs had occurred, and these embolic infarctions, by breaking down and disseminating their poison into the circulation, produced the secondary series of rigors from 15th to 19th. The alternative is that by plugging of the sinus the circulation was deflected, allowing the opposite patent lateral sinus to carry the infective material; but this does not seem probable, as previous to plugging the sinus there was freer circulation to carry off poisonous material, yet there was no such severe succession of rigors as those from 15th to 19th in the previous portion of the chart from the 1st to the 11th, and, moreover, had the infective material been carried by the opposite sinus, rigors would have been present from the 11th to the 15th.

A different condition was presented by the temperature chart in another case from the case of a patient who began to feel a pain in the head eleven days previous to admission to the Hospital.

Three days prior to admission the pain became much worse, which may have been due to the plugging of the sinus. A succession of rigors follows for three days, due to the disintegration of the thrombus, for at the operation the sinus and jugular vein were both found blocked. The obliteration of the sinus and vein entirely stopped the rigors, though the temperature remained irregular for some time. According to the notes of the case no extradural abscess was found at the operation. Recovery followed.

A chart from the case of a child aged six showed an irregular temperature, 100° – 104° , with a fall to normal at death. At the post-mortem examination there was breaking-down clot in the lateral sinus and the jugular vein was thrombosed. No meningitis. Pyæmic infarcts in the lungs. No convulsions occurred during life. It illustrated the absence of rigors in children, and also the progressive rise of respiration and pulse-rate to death.

In another case, post-mortem, much meningitis was found, and the lateral sinus is described as "simply a tube of pus." For this to have been so, it must have been blocked at either end by a firm coagulum, or the blood would have been washed away by the blood-current. The chart was really one of meningitis, with temperature rising to 107° at death, but it illustrates the prevention of rigors in septic thrombosis by a plug of clot at either end.

In relation with this may be mentioned a case recorded by Knapp in the Archives Otolaryngology, vol. xxi., in which there were no rigors, the temperature never rose above 101° , though the left lateral sinus, the superior longitudinal, and the torcular were all tightly filled with pus, prevented, however, from entering the general circulation by firm coagula in the left internal jugular vein and in the right lateral sinus.

And one by Kipp (Archives, vol. viii.), plugs retaining the pus; only one rigor ($T. 103^{\circ}$), whilst the temperature, with the one exception, never exceeded 101° . There was, however, a temporo-sphenoidal abscess.

Again, from a patient aged four. Post-mortem, fluid blood as far as the horizontal portion. Half-an-inch before termination of the sinus was dirty yellow pus. Thrombosis of internal jugular vein. Infarcts in both lungs.

The day before death the sinus had been opened and the clot

removed, but the internal jugular vein had not been tied. No rigors or convulsions.

The chart illustrated the absence of rigors in children, irregular temperature from breaking down of the clot, with a previous lull of four days, due to the occurrence of thrombosis. Swelling along the internal jugular vein was not noticed till two days, but this does not exclude the formation of thrombosis higher up before this date. It also illustrates the early intermittent and late remittent temperature, a not uncommon occurrence according to some observers.

Another chart was taken from a case which post-mortem showed diffuse septic meningitis, in addition to breaking-down clot in the sinus.

It illustrated the absence of rigors in children, and the change in the type of the temperature on supervention of meningitis and progressive rise to death.

Another case illustrates the cessation of rigors for three days after operation. A series of secondary rigors, due to either deflection of the current or to lung implication, though none was mentioned. A temperature of 108° , followed by recovery.

Another case, post-mortem, "Meningitis of base, pus in the lateral sinus, firm clot in jugular below. No evidence that pus had passed into the general circulation."

Death was due to meningitis.

Onset occurred on January 29th; rigors on 31st, February 1st (two) and 2nd.

It illustrates cessation of rigors on 4th, due to onset of thrombosis, and secondary rigors prevented by presence of thrombus in the vein, pulse-rate rising to death.

Lastly, a case admitted Nov. 1, death on 29th. Post-mortem, "Necrosis of temporal bone close to and involving the lateral sinus, which was filled with ante-mortem clot, not passing into the jugular vein. Fetid pus in both pleuræ and abscesses in the lungs."

I assume this to mean that the clot was not of long standing, and that it was not breaking down.

For the marked succession of rigors we have an evident cause in the necrosis involving the lateral sinus, and with a roughened area probably therefore present, and thrombosis not induced. This area would be constantly discharging infective matter into the circulation. That the sinus was not plugged early was probable, from the notes stating that on November 12th blood flowed from the ear on several occasions, as much as half an ounce at a time. This probably came from the lateral sinus, since the

necrosis involved its wall. The only other conditions I know of giving rise to large quantities of blood from an ear the subject of chronic disease are malignant disease and ulceration of the internal carotid artery, both of which were absent here.

From the recent appearance of the clot in the sinus I think it only fair to assume that it occurred not very long before death, and the sudden cessation of rigors on 17th for five days makes it likely that it occurred about this date, and was the cause of that cessation. The two rigors later have sufficient cause in the lung condition, for on the 19th the effusion present in the pleural cavities was serous (by the syringe), while on the 29th at the post-mortem pus was found, showing that the lung changes had progressed, and also practically negating any view that rigors previous to the 17th might have been due to this cause.

Prior, at any rate, to the 17th the chart represented the occurrence of pyæmia without thrombosis.

From these charts can be drawn the following conclusions:—

1. That absence of rigors is due to—
 - (a.) The patients being children.
 - (b.) The supervention of thrombosis cutting off the supply of infective material.
2. That rigors when present may be due to—
 - (a.) The onset, the primary initial lesion.
 - (b.) A continuous supply of infective material from that lesion, whether extradural abscess, involvement of minute veins, or a roughened area on the sinus wall, no protective thrombosis being formed.
 - (c.) The breaking down of clot in the lateral sinus.
 - (d.) Secondary embolic processes, abscesses in the lungs, pericarditis, &c.

As already mentioned, the local indications of sinus thrombosis may be very scanty, but I think that a thorough consideration of the temperature charts and the conclusions drawn from them, often give indications, apart from local signs, which can help us to diagnose whether we have to deal with a case without thrombosis or with thrombosis.

For, in the first class, we shall get a continuous succession of rigors from the very onset of the disease, and in the second, after the primary rigors, there will follow a break, due to the supervention of protective thrombosis, which in turn will be followed by a well-marked series of rigors due to the dissemination of infective material by its disintegration, giving a temperature chart described as typical of lateral sinus thrombosis. This is borne out by the examination of the cases I have at my

disposal, and where fairly complete notes have been taken from onset to finish, I find—

(1.) That cases without thrombosis, an extradural abscess being present or not, give a succession of rigors from the first onset to the close of the case, or until thrombosis was induced by tying the jugular vein and obliterating the sinus.

(2.) That in cases where thrombosis supervened before operation, there was always a break in the continuance of the rigors, varying one to five days, indicating the occurrence of the thrombosis, and that a series of rigors commenced again, indicative of the breaking down of the thrombus.

(3.) That in one or two cases, where at operation no thrombosis of the lateral sinus was found, and a break had occurred in the rigors, or they had ceased and not returned, or never been present, and death occurred shortly after, the roughened area on the sinus wall, contiguous to an extradural abscess, was covered with healthy clot which did not obliterate the whole lumen of the vessel, but which was evidently sufficient to stop, temporarily at all events, the further infection of the system.

(4.) That the initial series of rigors varies in length, according to the time previous to thrombosis supervening, which may occur as little as three days after the onset.

(5.) That in cases without thrombosis, where an extradural abscess is present, the rigors from the onset onwards are more occasional, and separated by greater intervals of time, than when no extradural abscess is present, but the cause of infection has to be sought in the small radicles from the middle ear. In the latter case the rigors follow each other much more frequently, daily, or sometimes oftener. Owing to the deficiency of correctness in the early history of cases, I do not think this can be held as absolute, but it occurs in sufficient frequency for me to present it as a suggestion of what may prove to be the truth on fuller future investigation.

Death in pyæmia occurs in several ways.

(a.) As a result of secondary meningitis.

(b.) Respiratory failure as result of great involvement of the lungs.

(c.) Gradual loss of strength, wasting, exhaustion, and collapse.

(d.) From sudden œdema of larynx (one case).

(e.) From peritonitis due to rupture of splenic abscess (one case).

(f.) Hyperpyrexia sometimes. Often death occurs with a temperature 104° – 105° .

INTRADURAL ABSCESS AND MENINGITIS.

An extradural abscess by destruction of the dura mater will involve the pia mater and underlying cortex of the brain. Should the inflammation become localised, we get a collection beneath the dura mater. Sometimes this is formed without any preceding extradural abscess, and then must be produced by an inflammation starting in the pia mater, due to infective material carried and deposited there by the blood stream.

Such a localised collection of intradural pus has been diagnosed and successfully evacuated by operation.¹

The symptoms of such an intradural abscess will be the same as those of an extradural abscess, *i.e.* deep-seated pain and tenderness to percussion, with additional symptoms due to involvement of the underlying cortex, if the latter be such as will, by its involvement, give rise to localising symptoms. If situated over the motor area, phenomena in the opposite limbs will indicate its position. More commonly such an abscess is of wider extent, associated with purulent meningitis, and the quantity of pus thrown out between the dura mater and the brain, amounting sometimes to several ounces, by its pressure causes additional symptoms.

The following forms of meningitis may occur:—

(1.) Acute non-suppurative, ending in resolution.

(2.) Acute suppurative: (a) Localised; (b) Diffuse; (c) Cerebro-spinal.

(3.) Tuberculous.

(i.) *Acute Non-Suppurative*.—As this results in resolution, no actual evidence of its previous presence is obtainable post-mortem; it should not be assumed, therefore, as non-existent.

Cases of apparent chronic ear-disease sometimes develop serious head symptoms,—headache, photophobia, strabismus, delirium, and even optic neuritis,—and yet completely recover without surgical interference.

It has been stated that optic neuritis may occur in chronic ear-disease alone, without any intracranial complications. This may be so, but to my mind there appears no reason to think this was dependent on anything else but some amount of meningitis which underwent resolution, the symptoms of which were so slight as to be unobserved, or, if observed, to have been considered trifling in nature.

Localised non-suppurative meningitis over cortex, not including the motor area, would give rise to no localising symptoms

¹ Brit. Med. Journ., Dec. 13, 1893.

beyond tenderness to percussion and deep-seated pain, and these occurring in the course of chronic ear-disease, in conjunction with other head symptoms, would appear due to meningitis, and not to ear-disease. That meningitis is not always fatal we have evidence post-mortem, for there is always some amount of plastic exudation round carious bone, glueing together the brain, meninges, dura mater, and bone, preventing the onset of diffuse suppurative meningitis; and what is this plastic exudation but a certain small degree of meningitis? We have evidence that greater inflammation of the meninges than this can take place with recovery, for in the *Lancet*, April 8, 1893, is recorded a case where fibrous tissue, the result of inflammation originating in ear-disease, glueing together brain, pia mater, &c., actually contained caseated pus, and by its contraction produced such pressure on the motor area as to cause violent epileptiform convulsions, resulting in death, with no evidence of acute meningitis.

It would therefore appear probable that localised meningitis resulting in resolution is not an uncommon occurrence in connection with chronic ear-disease. The following case serves as an illustration of such a condition.

Male, 16, admitted to St. Bartholomew's Hospital, October 13, 1890.

History.—Chronic ear-discharge for five years.

Eighteen days ago was run over by a cab, and was admitted to Hospital for three days, and then discharged. Soon after began to have pains in the head, which have increased.

Two days ago vomited and became drowsy.

On admission—Almost unconscious. Roused with difficulty. Head retracted and eyes half-closed. Eyeballs upturned. Pupils small but react. Muttering delirium. Breathing badly. Pulse 120; temp. 102°.

After three days temperature came down, he became conscious, and generally improved.

October 16th.—Optic neuritis found.

October 18th.—Quite intelligent. Pain in left ear, mostly posterior.

October 20th.—Temperature rose to 100° at night. Increased discharge from the ear lessened the pain.

November 11th.—Swelling behind ear subsiding in two days.

December 12th.—There has been gradual improvement. Left the Hospital.

(2.) *Acute Suppurative*.—This may arise by transference of infection from the middle ear to the meninges without involvement of intervening structures, the exciting cause being some-

times a blow on the head or ear, or it may be produced by continuity of disease spreading through the dura mater from an extradural abscess.

Again, it may arise from an intradural abscess, of which the commonest positions are over the roof of the tympanum, the squamous portion of the temporal bone, and then the cerebellar fossa; in fact, the same as extradural positions, the symptoms in the two cases being practically identical.

Secondary meningitis may arise by spread from thrombosis of the lateral sinus, or by the rupture of a brain abscess, and in these cases forms the fatal terminations of the lesions thrombosis and abscess.

The symptoms of acute suppurative meningitis vary according to the position, extent, and duration of the inflammation.

Typical symptoms may be described as follows:—

The onset is sudden, accompanied possibly by a rigor. Headache follows rapidly, severe in character, local or general independently of the situation of the inflammation, and often characterised by severe exacerbations. Vomiting and delirium appear early, this early appearance being a point in favour of meningitis, as opposed to abscess in a doubtful case. Giddiness and photophobia are often present. The patient resents interference, is morose and irritable, lies with flexed limbs, retracted abdomen, face and head hot or alternately flushing and paling, and contracted pupils.

Tache cerebrale may or may not be present. The temperature is raised to 101° , 102° , or higher, remaining at some elevated mean, rising and falling daily above and below this level, and does not show the marked up-and-down character of the chart of pyæmia. It sometimes varies under the two axillæ as much as three degrees, and is not always higher under the same axilla throughout the course of a case. It may rise above 108° at death.

Optic neuritis is often present, but sometimes entirely absent in a well-marked case. Pain may be complained of or increased on percussing the head, and retraction or rigidity of the neck be present without the meningitis necessarily involving the posterior fossa. The pulse is rapid, irregular, and small, and irregularity may be a feature of the respiratory rhythm.

After this early stage has lasted a variable time, the patient becomes drowsy, stupor supervenes, and he passes into coma, with pale face, cold sweating extremities, stertor, and involuntary evacuations. The pupils become dilated and insensitive, but may vary in size. The temperature remains elevated, sometimes rising high at death, and perhaps continuing to rise

after death has taken place. Occasionally respiration fails, while the heart continues beating feebly, but never for so great a length of time as it does in some cases of brain abscess.

Involvement of the base of the brain, especially of the posterior fossa, produces marked increase in retraction of the neck and head, amounting to opisthotonos in a few cases, and in addition cranial nerves may be implicated, the most common result being strabismus in varying combinations, and often changing rapidly from one kind to another. Severe pain in the eyes, or at the back of them, is usually an indication of meningitis at the base, but is not absolutely so, as the same symptom is occasionally present in abscess without associated meningitis. Involvement of the convexity produces the general symptoms above mentioned, and should the motor area be involved, phenomena in the opposite limbs will appear.

Convulsive movements are common to either the early or late stage, but typically more so in the first, as irritation is produced early. Rigidity and convulsive movements of the face, arm, and leg on the opposite side result from this irritation, and sometimes pass over to the other side of the body, without any meningitis over the corresponding motor area to account for it. With these convulsive movements the knee-jerks may be increased and ankle-clonus present, but these signs show marked variations during the course of a case.

As the inflammation proceeds, destruction of cells in the cortex takes place, and more and more pus becomes poured out between the brain and the dura mater. The cortex post-mortem is found softened, and stained yellow or greenish to a varying depth. The result of both these factors—namely, pus and cortex destruction—is to produce paresis, and finally paralysis of the opposite side of the body, till a loss of sensibility and complete hemiplegia results, sometimes with loss of knee-jerk, and also aphasia, if the inflammation be on the left side of the brain. Sometimes the first indication of paresis is that the patient does not voluntarily move the limb, but can do so with ease on request. The pulse-rate decreases in frequency, and when large collections of pus have been tapped by operation, an immediate rise of as much as 30 in frequency has attended its evacuation. In infants this increase of pressure causes the fontanelle to bulge.

A localised meningitis may give no more symptoms than those of the extradural abscess from which it arises, or of one in the same situation; and should the motor area be involved, we get spasm, rigidity, paralysis, &c., until, by the spread of the inflammation, the meningitis becomes diffuse, with any or all of the symp-

toms above mentioned. From diffuse another step forward involves the spinal cord, and a cerebro-spinal meningitis results. In addition to the symptoms dependent on the cerebral meningitis, there are added others due to the spinal, such as marked opisthotonos, and severe pains and hyperæsthesia of arms and legs, with various spasms or paralysis of the limbs according to the involvement of the spinal nerves. This cerebro-spinal meningitis is distinct from epidemic cerebro-spinal meningitis, though the ears may be involved in both. In the former, the ear condition is primary to the meningitis, and the pathological changes in the ear are usually advanced. Even when the meningitis starts from an acute otitis media, some differences are to be found, for the ear is generally filled with pus, and perforation of the membrane may have already taken place; whereas in epidemic cerebro-spinal meningitis the inflammation of the meninges is primary, and the pus in the middle ear does not fill it up to such an extent, and is, moreover, often only mucopurulent. The glairy fluid present in the ears of young children must not be mistaken for this mucopurulent fluid due to the cerebro-spinal meningitis. Moreover, both ears are usually affected in cerebro-spinal meningitis, but often only one in acute otitis media. The path of spread is in both cases the same—namely, by way of the internal auditory meatus, or by the processes of fibrous tissue carrying vessels which run from the ear to the meninges.

After chronic otitis media, the distance to which the inflammation spreads down the spinal cord will depend to some extent on the time at which death takes place. Indeed, the duration of life will often modify the symptoms of meningitis, for coma may supervene so rapidly that interference with motor and sensory nerves has not time to take place, nor optic neuritis to develop. Again, the irritable stage, with delirium, &c., may last a few days, and coma suddenly put an end to life, the comatose stage being but a matter of a few hours.

(3.) *Tubercular Meningitis*.—The presence of tubercle bacilli in some chronic ear-discharges would lead us to suspect that tuberculous meningitis might arise from this source. Tuberculous meningitis does occur in children, without any other obvious lesion being discovered, even after a most careful search, except a chronic ear-disease, and we are therefore led to consider this as the origin of the meningitis. It does not appear common in adults for tuberculous meningitis to arise from ear-disease.

Whenever it occurs, its symptoms are those usually described in text-books.

ABSCESS OF THE BRAIN.

Ear-disease alone, of all causes of abscess on the brain, accounts for about 50 per cent. of all cases. As injuries, &c., chiefly affect the cerebral hemispheres, ear-disease becomes almost the sole cause of cerebellar abscess.

Following ear-disease, the abscess usually occurs in one of two situations—the temporo-sphenoidal lobe and the cerebellum, but occasionally an abscess is met with in either the frontal, parietal, or occipital lobe, or in the pons.

Of 100 cases of abscess after ear-disease, 33 were purely cerebellar; 67 were cerebral (including 2 cases where there was an abscess in both). The male sex is more frequently the subject of abscess than females, in the proportion of 5 to 3 (in the 100 cases).

The complication is commoner on the right side in the total cases, and also when both ears were the subject of otorrhœa, and the preponderance of right over left appears due to females, and not males. For full details and deductions see statistical tables (p. 188). The abscess is generally single, but double abscesses occurred in three cases. In two of these there was one abscess each in the temporo-sphenoidal lobe and cerebellum, and in the third, one in the temporo-sphenoidal lobe, and one in the occipital lobe. When occurring in the cerebellum, it is generally in the lateral lobe, and rarely in the middle lobe. Two or three small abscesses are occasionally present in the lateral lobe in place of one of larger size.

The temporo-sphenoidal abscesses, by simple increase in size, sometimes involve the frontal, occipital, and parietal lobes, but it is unnecessary to make a separate class of these. Cerebellar abscesses are commonest between 11 and 20, and cerebral between 11 and 30, being nearly equal in frequency in the two decades, 11 and 20 and 21 and 30 (*vide* tables).

The earliest age afflicted with cerebral abscess was 1 year and 8 months, with cerebellar 2 years, while both may be met with above 50.

The duration of the otitis previous to the onset of the abscess varies considerably. In cerebellar abscess the shortest duration mentioned is three weeks, and in several others it is described as acute. The duration of three weeks is probably correct, as it occurred with scarlet fever, but there is no reason to show that the others may not have been secondary acute attacks of otitis. In cerebral, the shortest duration definitely stated is two months, and the few acute cases may again have been secondary acute

attacks. The longest duration of the otorrhœa, in both cerebral and cerebellar, was over thirty years (see tables). We find, therefore, that abscess occurs generally with otorrhœa of long standing, but can and does occur with either primary or secondary acute attacks.

Comparison of Tables III. and XIII. show that the greatest number of cases of pyæmia occurs in the first ten years of life, followed by a gradual decrease in the number of cases in each decade, while in abscess the first ten years of life are not most affected, but the maximum number of cases occurs in the years 11–20, closely followed by the years 21–30, with subsequent decrease in each decade. Does this mean that it requires a greater destruction of bone around the ear to produce an abscess than to infect the lateral sinus and give rise to pyæmia? Not exactly, for the important factor of drainage plays a part. The worse the drainage, the more quickly the unhealthy processes and bone destruction go on, and *vice versa*. It is a fact that cases of abscess arising by direct continuity outweigh in number those arising by carriage of infection; that is to say, that more abscesses are associated with carious processes in the bone than without them. The way in which infection is readily carried from the ear by veins running into the lateral and other sinuses has already been explained, and we can understand that bad drainage will have its first effect on the blood-vessels. Pathologically they are responsible in great part for the continuance of the discharge, which, if its outflow be prevented, has a tendency to at least slacken the flow in the blood-vessels, amounting, perhaps, in some small channels to reversal of current, and affording additional facilities for the absorption of infective matter into the small veins, and thus into the lateral sinus. The sinus is therefore likely to suffer early, and if it avoids infection, and therefore possible death to the patient, the bad drainage is given an opportunity to produce bone destruction, followed in due time by the formation of an abscess by continuity. If the drainage be not bad, the sinus is not so likely to be involved, and the bone changes can proceed slowly, but still with an ultimate tendency to produce a brain abscess. It may be stated thus—and it will be interesting if future investigation and observation during life prove it to be the case—that in chronic ear-disease bad draining tends to produce the earlier incidence of thrombosis of sinuses, while free drainage gives longer immunity, with tendency to abscess in later years. That bone destruction does not account for it all is, I think, evident from the fact that abscess is occasionally a complication of acute

otitis, when the bone changes have not had time to develop. In cases of abscess ending early in life, with a short history of discharge, we must suppose the drainage to have been defective; while in those ending later, with a corresponding longer history of discharge, we must suppose the drainage good. The shell of bone between the middle ear and the temporo-sphenoidal lobe is so extremely thin, and offers so much less resistance to unhealthy processes than do the structures between the middle ear and the cerebellum, that we should expect, other things being equal, that cerebellar abscess would occur later in life. But as a matter of fact (Table XIII. *b*) we find it is commonest from 11 to 20, whereas cerebral is commonest from 21 to 30. This can be explained by thrombosis of the lateral sinus being commoner in the earlier years of life, and because that lesion is more commonly associated with cerebellar than with cerebral abscess. Twelve cases out of 33 cerebellar had thrombosis of the lateral sinus, and of the 18 of these cases which occurred in patients up to 20 years of age, no less than 7 were associated with thrombosis. Therefore the occurrence of thrombosis of the sinus with cerebellar abscess lessens the age at which cerebellar abscess occurs more frequently as compared with the age at which cerebral abscess is most prevalent.

The formation of an abscess may take place in several ways.

(1.) By direct continuity-spread of inflammation through the bone, with or without an extradural abscess, plastic exudation fixing dura, meninges, and brain together, and extension inwards into the brain substance. This is the usual and commonest method of formation.

(2.) By intervention of inflammation of the lateral sinus, followed by involvement of the visceral side of the sinus in the inflammation, and thence infection of meninges and brain. This occurs chiefly in cerebellar abscess, but also in cerebral, though not to so great an extent. Eleven out of 67 cerebral cases, and 12 out of 33 cerebellar were accompanied by thrombosis of sinuses.

(3.) By deposition of infective material in the brain at some distance from the seat of infection, by thrombosis of veins and sinuses with reversal of current, or by conveyance along their perivascular sheaths. In such cases the abscess may have as much as one inch, but usually about one-eighth to one quarter of an inch, of healthy brain tissue between it and the seat of infection.

(4.) The combination of cerebral and cerebellar abscess on the same side of the brain is produced by the causes acting in

two directions at once, or by the same extradural abscess spreading in two directions.

(5.) The formation of occasional abscesses at a distance in the frontal or occipital lobes can be accounted for by conveyance of infection by blood-vessels after reversal of current in them by thrombosis of sinuses, or by conveyance to the lungs and thence back to the brain.

(6.) Abscesses in the opposite side of the brain to the ear-disease may be formed thus—

(a.) By spread of thrombosis through the cavernous sinuses into the opposite petrosal sinuses, and infection of the brain from these.

(b.) When two abscesses occur, one old-encapsuled, and the other recent and non-encapsuled on the opposite side of the brain (ear on this side being healthy), and no thrombosis of sinuses is present, we can only conclude that the infective material was conveyed into the general circulation, and thrown again into the brain circulation and arrested there.

As a rule, abscesses follow chronic ear-disease, disease of the tympanum being more likely to produce cerebral abscess, and of the mastoid cells cerebellar. An abscess from a chronic fetid discharge contains fetid yellowish-green pus, and occasionally foul gas, and the reaction of its contents is alkaline if of long standing. The fetor is due to the action of saprophytic bacteria. In an abscess from acute otitis media the pus is yellow, without odour and acid in reaction, if of short duration.

An acute abscess has an irregular shreddy wall, whilst a chronic one has a smoother pyogenic membrane of varying thickness.

Round an acute abscess there is always a surrounding area of softened brain tissue. Post-mortem there is found round an encapsuled one some inflammation, and it seems probable that this was the cause of the acute symptoms preceding the death of the patient.

The capsule takes a variable time to form, which cannot be estimated in ear cases, but in traumatic ones has been found commencing during the second week, and fully formed after two months, but sometimes the abscess remains longer than this without any capsule formation.

When formed, the abscess increases in size, provided the inflammation to which it gives rise be not severe enough to cause the immediate death of the patient, and apparently the capsule does not interfere with this increase; for it is hard to believe that a large encapsuled abscess has grown to its present

size without any symptoms and then become stationary and permitted a capsule to be formed.

Increase in size may bring the abscess nearer to the diseased bone, and allow of discharge externally, as already shown in pyæmia.

It may involve the meninges and produce fatal meningitis, either by bursting into them or by involving them in the surrounding inflammation before actual rupture takes place; or, again, it may end fatally by rupture into the lateral ventricle.

An abscess may be produced by a secondary acute attack of otitis media of only a few weeks' duration, and remain dormant in a capsule with subsidence of ear-discharge until aroused into activity by another attack of otitis media, or by some external influence such as a blow on the head. Increase in size flattens the convolutions over it, and involves fresh areas of brain tissue, these possibly giving rise to fresh symptoms. From the pathology of the production of an abscess by contiguity it will be seen that the commonest position for an abscess in the temporo-sphenoidal lobe ought to be in its posterior half, and in the cerebellum the anterior portion of the lateral lobe rather towards its outer side, for here it approaches the lateral sinus and petrous bone from which infection is derived. Both these situations are found in actual practice to be the commonest ones.

SYMPTOMS.

Absence of symptoms is sometimes a marked feature, while, on the other hand, a great variety of symptoms may be met with in a long series of cases.

The absence of symptoms depends on—

(1.) Presence of the abscess in situations of which involvement causes no local and few general symptoms, such as the white matter, whereas when the grey matter and tracts are involved symptoms become more prominent. When the abscess can be syringed and probed, and the brain many times explored without production of any definite symptoms, their absence is not to be wondered at.

(2.) Parts being bilaterally represented in the brain, it seems probable that if both sides be developed and educated, the one not involved could take on the function of the involved side. Where only one side is educated, as the speech centre, the opposite side cannot take on its function, and the absence of the normal condition is then a great guide to the situation of the abscess.

(3.) In some measure the rate of development of the abscess will play a part, for chronic encysted abscesses often produce none but slight symptoms till acute inflammation ensues with more definite indications of its presence.

(4.) Masking of symptoms by those of another condition, such as meningitis and thrombosis of the lateral sinus.

When an abscess commences, it gives rise to some slight symptoms, such as pain in the head, a rise of temperature, vomiting and giddiness, and there may also be a rigor or convulsive seizure, usually with cessation or diminution of discharge. Following this the temperature falls, in a typical case remaining normal or subnormal.

As it increases in size it involves fresh areas of brain substance, and symptoms such as paralysis, &c., may become evident. Should it become encapsuled, it may give rise to no symptoms till inflammation produces terminal acute effects.

The close of the case may be produced by the mere presence of a large chronic abscess, or of an acute one, or by rupture of the abscess into the lateral ventricle or on to the surface of the brain, inducing meningitis.

All gradations are present between an acute and a chronic abscess.

Symptoms of abscess may be divided into General and Localising. In some cases it is difficult to place a given symptom in one or other class.

A.—General Symptoms.

Headache and Pain.—Often the earliest indication. It varies in severity, but is most often agonising, and sometimes requires extremely large doses of morphia to relieve it. It is of a dull aching character, and its situation is no safe guide to the situation of the lesion, for its position may vary during the course of a case, and be either local or general. It is sometimes only in evidence on change of posture, none whilst the patient is recumbent, but immediately on sitting up, or on any exertion, or on percussion of the head, pain of an agonising character is experienced, sometimes lasting for an hour or two after the exciting cause has ceased to act; it is not uncommonly paroxysmal in nature. Occasionally intense neuralgic pain localised to one spot is the only and earliest symptom of abscess.

General Depression and Debility.—Every organ and function of the body is involved to a greater or less extent in this.

Pallor or Muddiness of the Skin may be present, and towards the end a sickening odour may exude from it.

Abdominal Symptoms.—Loss of appetite, fetor of breath, nausea, vomiting, constipation, retracted abdomen, and rose spots.

(a.) In contradistinction to loss of appetite, there is occasionally present a voracious appetite for both food and drink, while sometimes any fluid is eagerly taken, but solid food refused.

(b.) Fetor of breath depends probably on constipation and indigestion with accompanying foul mouth. The tongue becomes dry and brown in the later stages and is sometimes tremulous.

(c.) Vomiting may be present only at the onset or termination of a case, and may be constant and severe throughout or entirely absent. By exclusion of mixed cases of cerebral and cerebellar abscess, vomiting would appear rather more frequent in cerebellar abscess, for it is mentioned as occurring eighteen times in 33 cerebellar cases and thirty-three times in 65 cerebral.

In the 18 vomiting cerebellar cases thrombosis of sinuses occurred five times, and in 33 vomiting cerebral cases also five times. We thus get that in

33 vomiting cerebral cases 5 had thrombosis and 28 had none.

33 vomiting cerebellar cases 9 had thrombosis and 24 had none.

This shows that in cerebellar abscess the association of thrombosis and vomiting is present in a greater proportion than in cerebral. But we cannot ascribe the excess of vomiting in cerebellar abscess to thrombosis, because in those cases in which vomiting is not mentioned we have no definite statement that it was absent. The absence of this denial of the presence of a symptom is the one cause which makes so many records worthless for compilation of statistics. Fœtor of abscess contents does not appear entirely to cause vomiting, for though it is more frequent with fetid abscesses, probably because fetid abscesses outweigh in number non-fetid, yet severe and constant vomiting is present in non-fetid abscesses.

It may be that the few cases of vomiting with non-fetid abscesses depend on some undiscovered cause, and the vomiting of fetid abscesses, at least in part, on some product absorbed from the abscess. Nausea, vomiting, and giddiness, like pain, are occasionally absent in a recumbent position or brought on only by change of position. Vomiting, as a rule, has little relation to the ingestion of food.

Vomiting early in the case, associated with an irregular temperature, is suggestive of thrombosis of the lateral sinus;

with delirium, of meningitis. A low temperature with vomiting occurring late is in favour of abscess.

(d.) Constipation is nearly always present in abscess.

(e.) Retraction of the abdomen is not common.

(f.) Rose spots on the abdomen are rarely present.

In a case of cerebral abscess recorded in the *British Medical Journal* of 1886, they came out in crops and resembled the rose rash of enteric fever, but there was no ear-disease in this case. They have, however, occurred with abscess after ear-disease.

Emaciation becomes a marked feature in some cases, probably induced by general depression, indigestion, vomiting, and constipation. When present with no vomiting, it may be due either to deficient ingestion of food or assimilative power.

Mental Condition.—At the onset a change in manner or disposition may be noticed, followed by drowsiness, headache, and dulness of intellect. Giddiness and vertigo are sometimes present. As the case proceeds, delirium, stupor, coma, and death follow. Yawning is occasionally noted. Melancholia, and rarely a suicidal tendency, may be the most noticeable features.

The state of slow cerebration is very suggestive of abscess. All mental efforts are performed without their usual vivacity. Loss of memory is present, and only when roused does the patient appear capable of appreciating the import of questions, and then the answers are given slowly, deliberately, and after a pause, as though it required a considerable amount of effort to bring into play the natural forces habitually co-ordinating the relation between thought and speech. Letters may be dropped and movements sluggishly performed. At other times special faculties seem dull; the patient may not recognise those about him, but be capable of performing complicated movements and be rational in his conversation. Coma is common towards the end, though the patient occasionally recovers intelligence for a time, relapsing again into his former condition.

Sphincters.—Retention and incontinence of urine and fæces only appear at a late stage.

Temperature.—The typical temperature of an abscess is a rise to 101° or so at the commencement, followed by a gradual fall to normal during the formation of the abscess, the temperature then remaining normal or below. The even course of the sub-normal temperature may be broken by an abrupt rise attending a rigor, but the temperature immediately resumes its low level. Occasionally it is hyper-pyrexial at death.

In the majority of cases when the abscess is evacuated by

operation the temperature rises and falls again. In uncomplicated cases, if the abscess be large the temperature may remain high throughout, but this is exceptional.

Pulse in a typical case shows progressive decrease in frequency till a rate of 55 to 45 has been attained. Here it remains; but it may descend much lower than this, even to 10 a minute. It is irregular and full. A marked rise, as much as 30 or 40 a minute, accompanies evacuation of an abscess, and it remains a little raised with the corresponding elevation of temperature, finally assuming its normal healthy rhythm.

Its slowness cannot be entirely due to pressure, because in one case the pulse did not fall below 80, yet the pus shot out several feet when the abscess was opened, and also because the pressure in meningitis is probably no less than in abscess, and yet we get no decrease in pulse-rate.

Respiration is decreased in frequency, and often shallow. Towards the end it may become irregular and of the Cheyne-Stokes variety. Sometimes respiration ceases whilst the heart continues to beat, and artificial respiration has been performed for six hours before death ensued.

This cessation of respiration occurs suddenly and quite spontaneously, though it is sometimes induced on administration of chloroform for an operation, and on evacuation of the abscess respiration may be gradually resumed if artificial respiration be performed.

Urine.—In one case of cerebral abscess this contained sugar and albumen. In this case no mention was made of its amount, nor of the presence or absence of other symptoms of diabetes. We should expect sugar in the urine to be present more commonly in cerebellar abscess, for pressure on the medulla may produce both sugar and albumen in the urine.

Analysis of the urine of two cases of brain abscess (Somerville, *Lancet*, September 1887) showed that it was characteristic of the febrile state with diminished chlorides and increased phosphates. After operation more urine was passed, and the proportions of chlorides and phosphates became gradually normal.

Vasomotor Phenomena.—Alternate flushing and pallor are occasionally seen. In one case of cerebellar abscess in the right lateral lobe the right arm, hand, and face were spotted red and hot, whilst the left side was pale and cold.

B.—*Localising Symptoms.*

Tenderness on percussion and pain, if always confined to one spot, may be of value in localisation. Occipital headache and pain in the neck and back on one side are in favour of cerebellar abscess. Rigidity of the neck muscles is sometimes an indication of it, as it is also of meningitis.

Sensory and Motor Phenomena.—(a.) *Spasms and Rigidity.*—Convulsive twitchings of the opposite limbs may be the first localising symptoms. Convulsions occur at the onset and at the close of a case when rupture occurs into the lateral ventricle. If they occur in succession, the patient becomes less conscious during the intervals—that is to say, recovery is not complete—and some paresis of the affected muscles may be left. They replace rigors in children, and are then general in their distribution. They arise from irritation of the motor tract or motor area by spreading and enlargement of the abscess, involving these parts in the surrounding inflammation. They are commoner in cerebral abscess from its situation nearer the motor area, &c.

(b.) *Anæsthesia.*—Impairment or loss of sensation is not very common. It occurs in cerebral abscess in association with paresis or paralysis of the opposite limbs from pressure on the posterior part of the internal capsule. It may also be present in cerebellar abscess from pressure on the pons. Numbness and tingling of the opposite limbs are occasionally the first localising symptoms in cerebral abscess.

(c.) *Hyperæsthesia* is rarer than anæsthesia, and is occasionally met with in cerebral abscesses accompanying motor phenomena in the opposite limbs.

(d.) *Paresis and Paralysis* often comes on quite suddenly, unattended with loss of consciousness. If the abscess involve or press on the internal capsule, paresis or paralysis of the opposite side of the body will occur, according to the amount of involvement of the tract, amounting often to complete hemiplegia. These may be accompanied by partial or complete anæsthesia. These occur in cerebral abscess. In uncomplicated cerebellar abscess we get two conditions:—

(1.) Paresis or paralysis of limbs on the side of the body opposite to the abscess, from pressure on the upper part of the pons.

(2.) Paresis or paralysis of limbs on the same side of the body as the abscess, from pressure on the lower part of the pons, or on the medulla. The arm is most affected, and should

the ocular muscles share in the weakness, there may be conjugate deviation of the eyes to the opposite side. Neither of these conditions is common, but as they do occasionally occur, they must be borne in mind.

Aphasia.—(a.) *Motor* is produced by an abscess involving the speech centre in the posterior part of the third left frontal convolution, or by involvement of the centre or nerve fibres from it in the inflammation surrounding a left temporo-sphenoidal abscess, or by the pressure of such an abscess on the centre or fibres from it. As abscess in the frontal lobe rarely occurs as a result of ear-disease, it follows that aphasia is more often due to pressure and surrounding inflammation.

(b.) *Sensory*, as evidenced by word-deafness, indicates a lesion of the upper extremity of the first temporo-sphenoidal convolution.

The occurrence of either sensory or motor aphasia will therefore indicate a cerebral, and not a cerebellar abscess.

Reflexes.—Both skin and patellar reflexes are absent or diminished in the paralysed leg of hemiplegia.

The patellar reflex on one side may be lost with a cerebellar abscess in the lateral lobe of the same side, the other remaining natural; but on the other hand, pressure on lateral columns of the medulla cuts off the fibres inhibiting the knee-jerk, and it is increased.

Attitude, Equilibrium, and Vertigo.—The decubitus of the patient is not often mentioned in records. It has been stated that it is a point in favour of cerebellar abscess for the patient to lie with the side of the face corresponding to the side of the lesion uppermost, the concavity of the body being also towards the lesion. In the three cases in which decubitus is mentioned in cerebellar abscess, they all lay on the same side as the lesion. Incoördination of movement is produced by pressure on the middle lobe of the cerebellum, and thus staggering and unsteady gait is present in cerebellar abscess.

Vertigo is sometimes present, and may only be brought on by change of position or closing the eyes. There is a tendency to fall towards the affected side; but this is not always the case, for the tendency may be to fall forwards or backwards.

Abscess in the Pons.—Though very rare, it is as well to bear in mind that, if of sufficient size, it may produce difficulty of deglutition and articulation, alternating hemiplegia or bilateral paralysis of face and limbs.

AFFECTIONS OF THE CRANIAL NERVES IN DIAGNOSIS OF THE COMPLICATIONS.

1. *Olfactory* is of no value in diagnosis. The position of the olfactory bulb is such that it could not be affected in thrombosis of sinuses, and unlikely to be involved in abscess, as this is rare in the frontal lobes.

2. *Optic*.—Loss of sight is occasionally complained of. The two great affections of this nerve are : (a.) Homonymous hemianopia ; (b.) Optic neuritis.

(a.) *Homonymous Hemianopia* is the result of pressure on, or involvement of, the posterior part of the optic thalamus or nerve fibres for the optic nerve between the centres and the chiasma. It is not a common symptom, possibly because its presence is not often looked for. We should expect it to be common in temporo-sphenoidal abscess, because the fibres from the external geniculate body to the cuneus pass through that lobe.

A left temporo-sphenoidal abscess will obliterate impressions from the right half of the field of vision, and a right abscess from the left half. The presence of this symptom is an indication of the side and situation of the abscess, and excludes at once involvement of the cerebellum.

(b.) *Optic Neuritis* originates from any of the lesions under consideration. It is usually double, especially in meningitis ; but in thrombosis, and more frequently in abscess, it may be on one side only—that of the lesion. When double, it is often first observed on the side of the lesion, quickly followed by its appearance on the other side, though the intensity on the side of the lesion may remain greater than on the opposite side throughout the whole course of the case. It is always an acute neuritis, whether or not the lesion causing it be chronic.

Its duration varies according to circumstances.

After operation it often subsides rapidly, disappearing in as short a time as fourteen days in thrombosis, and four weeks in abscess. The rapid disappearance in some cases of successfully evacuated abscess is possibly due to the neuritis being the result of pressure on the nerve fibres, or to their involvement in the area of inflammation surrounding the abscess, both of which rapidly subside on discharge of the contents of the abscess. It is entirely absent in a great many cases of any of the complications of otitis, even when looked for, and I think this may be due to death occurring before it has had time to develop to an extent appreciable by the ophthalmoscope ; for sometimes, when the diagnosis is obvious, optic neuritis does not make its appear-

ance till far on in the case. Should the patient survive, recovery of function of the nerve is complete, no impairment of vision resulting. This is not very remarkable when it is considered that with extreme optic neuritis no diminution of the visual powers is complained of, making allowance, of course, for the mental condition of the patient. It is seen earlier in meningitis than in abscess. As it occurs in cases in which no gross cause involving the optic nerve itself can be found for it post-mortem, it must be produced by an affection of the brain or meninges.

Rohrer suggests that optic neuritis is due to blockage of lymphatics round the carotid artery hindering the flow from lymphatics round the ophthalmic artery. Against this we have absence of optic neuritis where such changes have taken place round the carotid as to cause ulceration of its walls, rupture, and death of the patient. It has already been mentioned that optic neuritis occurring in ear-disease is probably the result of some amount of meningitis which ended in resolution. It is usually said that optic neuritis in meningitis arises by extension of inflammation from the meninges along the sheath of the nerve, and some would go so far as to say that optic neuritis is never present unless there is meningitis. In some cases of abscess with optic neuritis we cannot find any naked-eye evidences of meningitis after death. Those who contend this must admit that the meningeal inflammation may be so slight as to give rise to no evidence of its presence post-mortem, and must therefore be little more than a slight hyperæmia. If so slight an inflammation can produce optic neuritis, why is it not present in every case of well-established meningitis, or in a large abscess, both of which must produce some general hyperæmia, and how is its absence to be accounted for in cases of marked basal meningitis, which of all others is most likely to involve the optic nerve in inflammation? It may be that death occurred before the neuritis was advanced enough to be discovered.

In the case of abscess, extension of inflammation along the nerve tracts going to the optic nerves produces optic neuritis, which often does not appear till late in those cases of abscess involving the fibres from the external geniculate body to the cuneus, should they survive long enough to permit of its onset. The cause of this may be due to the inflammation taking longer to travel by the nerve fibres themselves than by the sheath of the nerve; for in meningitis optic neuritis appears early, especially if the base of the brain be involved. It may also explain why, in some cases of abscess, optic neuritis does not appear till secondary meningitis is induced, that is, that the meningitis has

produced the optic neuritis before the abscess has had time to do so. Obviously, the exact reasons of its presence and absence are not entirely understood.

In part, at least, its absence in some cases of abscess may be due to the abscess and its surrounding inflammation not involving the nerve fibres, and that it is only when the abscess reaches a certain size, or the surrounding inflammation takes place to a greater extent with the onset of terminal symptoms, that it is produced, or would be so did not death prevent it. In cases where it has been examined for the result recorded, I find—

	Mention of it in	No Optic Neuritis.	Double.	One Side.
In 100 cases of pyæmia . . .	47	16	26	5
In 20 cases of meningitis . . .	12	5	7	...
In 100 cases of abscess . . .	46	14	23	9
In 100 { 64 cerebral . . .	34	10	17	7
{ 33 cerebellar . . .	11	4	5	2
{ 3 mixed . . .	1	...	1	...

The absence of mention of optic neuritis may be due to incompleteness of notes, or to its having been looked for, not found, and therefore left to future readers of the records to assume its non-existence. Of the twenty-four cases of cerebral abscess which were accompanied by this symptom, seven were complicated by meningitis, pyæmia, or both, leaving optic neuritis present in fourteen uncomplicated cases. This is sufficient to show that abscess does produce neuritis without associated meningitis (in so far as post-mortem examination reveals).

Its presence being known with certainty in only five cases of cerebellar abscess is not sufficient to investigate the correctness of the statement that optic neuritis is commoner with cerebellar than with cerebral abscess, or that this may be due to the more common occurrence of meningitis with the former.

For the absence of mention of optic neuritis in so many records, the above table will not carry us farther than to say that optic neuritis is a common occurrence in all the three important complications. If we could be sure that it had not occurred in the cases in which no mention of it is made, we should get it present—

31 times in 100 cases of pyæmia.
 35 " 100 " meningitis.
 32 " 100 " abscess.

Thus making it a little the commonest in meningitis, but nearly equal in all three. This is not, however, a sufficient foundation to make it a definite statement.

3. *Oculo-Motor and Ocular Symptoms*.—This nerve supplies four muscles of the eyeball, the levator palpebræ, the sphincter of the pupil, and the ciliary muscle. Its involvement will, therefore, cause a number of occurrences.

(a.) *Paralysis*.—Paralysis of the fibres supplying one definite muscle can rarely be made out, with the exception of those supplying the levator palpebræ when ptosis results. We can understand that irritation and compression of the nerve may both occur, the former causing various and temporary squints, while the latter, when the whole nerve is involved, results in inability to move the eye inwards or upwards. The nerve can be involved in meningitis, thrombosis of the cavernous sinus, and in abscess.

In meningitis it is fairly common, especially when involving the base, and then both eyes usually suffer. In thrombosis it occurs if the cavernous sinus be involved and is on the same side as the ear-disease. If the inflammation spread to the opposite sinus, the other eye also suffers. Even in thrombosis of the lateral sinus some temporary strabismus is occasionally present, due possibly to slight involvement of the cavernous sinus, with rapid resolution.

In abscess it occurs without any associated meningitis, and is indicative of pressure on the nerve during its course. It is commoner in cerebral abscess, and when involvement of this nerve occurs in cerebellar abscess, it would appear due to associated meningitis rather than to pressure of the abscess itself. Ptosis appears to arise most commonly from cerebral abscess, and both it and divergent strabismus are almost invariably on the same side as the abscess.

Strabismus occurs also in general convulsions replacing rigors in children.

(b.) *Pupils*.—As the third nerve carries contracting impulses for the sphincter muscle of the iris, paralysis of it causes dilatation of the pupils.

Great variation in them may occur during the course of a case. They may be dilated, contracted, equal or unequal, and are often sluggish. As coma deepens they become dilated and fixed, becoming more contracted, and then returning to normal after successful operation.

In meningitis they are commonly contracted, the possible result of that lesion being more prone to cause irritation of the nerve than compression.

In thrombosis of the cavernous sinus compression of the nerve may produce dilatation of the pupil on the same side.

In abscess a similar result may occur, and when they are equal it is occasionally noted that under chloroform the pupil on the side of the abscess becomes more dilated than the other. In rare instances in later stages the corneal reflex may also be absent on the side of the abscess. Bearing in mind the complicated mechanism governing the movements of the pupil by means of the optic ocular motor and cervical sympathetic nerves, it is not difficult to understand how easily their size may vary, and of what little real value, apart from other symptoms, their condition is in diagnosis.

(c.) *Nystagmus* is not a common symptom. It occurs more frequently in cerebellar abscesses, and is horizontal.

(d.) *Photophobia and Blepharospasm* may occur in meningitis, abscess, or thrombosis, and are much less common in abscess than in meningitis.

(e.) *Deviation of the Eyes* is rarely seen, but does occur in temporo-sphenoidal abscess, and then follows the ordinary course of conjugate deviation, namely, towards the lesion, or away from the lesion during a convulsion.

(4.) *Trochlear*.—Symptoms due to the paralysis of the superior oblique muscle are easily covered by those due to paralysis of the third and sixth nerves, and we can understand that affection of this nerve by itself is not of great value for localisation. From anatomical considerations it will be seen that it can be involved in basal meningitis, thrombosis of the cavernous sinus, and the pressure of an abscess.

(5.) *Trigeminal*.—Affections of this nerve are all rare. They are :—

(i.) *Anæsthesia* has occurred on the same side as the cerebral abscess, and on the opposite side. In the first case we must suppose the abscess caused pressure on the nerve, and in the second on fibres running from the centre to the opposite cortex.

(ii.) *Hyperæsthesia* has been noticed in one case of cerebellar abscess, and on the same side; possibly due to irritation of the nerve.

(iii.) *Paresis or Paralysis of Muscles Supplied by it*.—Paralysis of the masseter on the same side as a cerebellar abscess has been noted, but the abscess in this case did not originate from ear-disease. Rigidity of the masseters also occurs from meningitis about the pons involving the nerves.

(iv.) *Herpes*.—I have found this noted altogether in four cases of abscess, two cerebral and two cerebellar, one of each having meningitis. One of the two cerebellar did not arise from ear-

disease. In three cases it occurred on the same side of the face as the abscess, and in one the side of the herpes is not stated. There is a definite statement of the absence of meningitis in two cases. From this, and from its absence in meningitis, it would appear to be due to the abscess, unless its occurrence in every case was a coincidence.

(6.) *Abducens*.—Paralysis of it produces internal strabismus. This is produced by thrombosis of the cavernous sinus, and also by both cerebral and cerebellar abscess by compression of the nerve against the pons. Whether due to cerebral or cerebellar, it is on the same side as the abscess. Abscess also appears to be the most frequent cause of it.

(7.) *Facial*.—(a.) *Facial Paresis or Paralysis* is not uncommon, and occurs at all ages. The youngest patient I have knowledge of afflicted with it as the result of ear-disease was eight months old. It occurs (i.) with ear-disease on the same side; (ii.) with an intracranial lesion on the opposite side.

(i.) As the result of ear-disease it is a symptom to be observed, because, as a rule, it is indicative of caries of the Fallopian canal, but not always so. Inflammation may spread along the nerve in the canal from the tympanic cavity, with accompanying secretion and compression. Moreover, in a few cases the canal is congenitally deficient, and the nerve in these lies merely in a narrow groove, so that compression may take place by the direct pressure of inspissated secretion in the tympanic cavity. The chorda-tympani shares in the paralysis. The absence of taste is often missed from non-observation. As a result of ear-disease it is rarely met with on both sides at the same time. It occasionally occurs double, from ear-disease on the one side, and from the lesion resulting from the ear-disease producing it on the opposite side. In the first case the supra- and infra-orbital parts of the nerve will be equally affected, while in the latter the supra-orbital part to a much less extent.

(ii.) Intracranial lesions producing it are—(a) Basal meningitis; (b) Destruction of motor cortex by extensive meningitis; (c) Abscess with resulting hemiplegia—this is its commonest cause; (d) Abscess in the pons; with it there is then often hemiplegia on the opposite side or paralysis of the sixth nerve.

(b.) Twitchings of the facial muscles arise from—

(i.) Basal meningitis on the same side.

(ii.) Meningitis over the motor area for the face on the opposite side of the brain.

(iii.) Abscess on the opposite side of the brain irritating the motor area.

(iv.) Abscess of the cerebellum on the same side, from the

meningitis it induces, or from its effects on the cerebellar cortex which has connections with the cerebral cortex of the opposite side. If the irritation thus produced were great enough, it might set going actions in the cerebral cortex which would produce twitchings of the face.

(8.) *Auditory*.—Deficiency of hearing is so likely to be associated with the chronic ear-disease that the value of the absence of hearing for localisation purposes is very little. If by exclusion of bone-conduction tests the nerve be shown involved, it indicates disease of the labyrinth, which is more likely to be associated with cerebellar abscess than cerebral.

(9.) *Glossopharyngeal* might be involved by meningitis extending down the medulla, and also by extreme pressure from a cerebellar abscess. The loss of sensation resulting to the tongue, tonsils and pharynx might produce some difficulty in swallowing.

(10.) *Pneumogastric* is of no value in diagnosis.

(11.) *Spinal Accessory*.—Paralysis might occur from pressure of a cerebellar abscess. I have never seen or heard of its occurrence from this source. Should it do so, paralysis of sternomastoid and trapezius on the same will be present.

(12.) *Hypoglossal* occurs (*a.*) as part of a hemiplegia from an abscess on the opposite side.

(*b.*) From a cerebellar abscess on the same side.

(*c.*) From extensive caries of the mastoid bone. The hemiatrophy which may be present recovers on removal of the bone.

DIAGNOSIS BETWEEN CEREBRAL AND CEREBELLAR ABSCESS.

From consideration of the symptoms detailed it will be seen that in favour of cerebral abscess the following symptoms are of importance, namely, motor and sensory aphasia, anæsthesia, especially when associated with partial or complete paralysis of the limbs on one side, and a persistent painful area to percussion situated in the temporal region.

In favour of cerebellar are persistent occipital headache, a most important indication, with or without retraction of the neck, vertigo and reeling gait. Nystagmus, clenching of the teeth and yawning, are said to be commoner in cerebellar abscess. Persistent and severe vomiting, if anything, is in favour of cerebellar, in the absence of symptoms definitely pointing to cerebral. Paralysis on the same side of the body to the ear-disease is in favour of it, as it arises from pressure on the cord. The condition of the patellar reflex on the same side of the body as the ear-disease may also suggest cerebellar

abscess. With extreme difficulty in diagnosis, the more common association of cerebellar abscess with mastoid disease, and of cerebral with disease of the tympanum, may be of service. Swallowing may be difficult from pressure on the pons, and hypoglossal paralysis of the same side may be present.

A fatal termination in abscess may be produced by—

(1.) General debility, depression, and malnutrition, followed by exhaustion, stupor, and coma.

(2.) Rupture of the abscess into the meninges, causing sudden death or fatal meningitis.

(3.) Hyperpyrexia occasionally.

(4.) Failure of respiration, the heart continuing to beat. Artificial respiration fails unless the abscess be opened, and even then respiration may not be resumed. Sometimes this failure of respiration is accompanied by increased pulse-rate and temperature, even to hyperpyrexia.

(5.) Ulceration into the internal carotid artery. In rare cases this causes death before the accompanying intracranial lesion does so.

(6.) Rupture of the abscess into the lateral ventricle. This occurred seven times in forty-nine cases in which a post-mortem examination was made. That is, its occurrence is one in seven.

Its occurrence can sometimes be recognised by the symptoms it produces. Sudden heaviness and drowsiness followed by coma and loss of reflexes. The pupil on the same side as the abscess, or on both sides, may be dilated and insensible to light. Or, again, there may be sudden delirium, vomiting, agonising headache, Cheyne-Stokes respiration, slow cerebation, and paralysis of all the extremities. The temperature may rise, or, if previously elevated, may fall somewhat. Huguenin says spasms of both sides of the face, or of both legs, without loss of consciousness, is an indication of it.

Without the abscess actually bursting into the ventricle, some changes are not infrequently found in them. The walls may be vascular with increased fluid, often semi-purulent, and the septum lucidum may be quite disorganised. These changes would appear due to the inflammation surrounding the abscess, as they occur when the abscess is as much as one centimetre from the ventricle, and even when it possesses a well-marked capsule. The nearer the abscess to the ventricle, the more marked, as a rule, are the changes. The way of least resistance for an acute cerebral abscess to spread is towards the lateral ventricle. Sometimes thickening of the choroid prevents a near abscess involving the ventricle from actual commu-

nication with its cavity. An excessive quantity of fluid in the lateral ventricles is sometimes caused by an abscess in one lateral lobe, or by the rare occurrence of an abscess in the middle lobe of the cerebellum, pressing on the veins of Galen.

To complete the list of complications, it is necessary to briefly mention ulceration into the carotid artery, malignant disease, and septicaemia.

Ulceration into the Carotid is seen in cases where there is some considerable amount of bone-disease. Sometimes sloughing invades not only the tissues surrounding the artery, but also those internal to it, even to perforation of the pharynx.

Ulceration into the artery is not a very common occurrence, but it may be the cause of death, with or without an intracranial lesion. Several small hæmorrhages may occur before death ensues, or one severe one may prove fatal.

Hæmorrhage from the lateral sinus is even rarer, though cases are recorded. These two and malignant disease are the only causes of large quantities of blood from the ear in chronic otitis.

Malignant Disease is rare. When it occurs, the auricle is a little prominent, and the surrounding infiltration involves the parts anterior to the meatus as well as those posterior. Inflammatory affections, as a rule, are posterior only. Pain is severe, requiring much morphia for its relief, and is increased by movement of the head. The temperature is not raised, and in some respects, in early cases, malignant disease simulates cerebellar abscess.

Septicaemia occurs rarely as a complication of otitis media. When it does, it may end in recovery or death. Erythematous patches occur about the body with a raised temperature, which does not show the marked up-and-down character with rigors of pyæmia. Metastatic abscesses are absent, though simple pleurisy and pericarditis occur. Nephritis may also be present, with accompanied hæmaturia and albuminuria.

Bacteriology.—The number of micro-organisms found in chronic discharges is very numerous. Both acute and chronic discharges from the ear after rupture of the membrane, and the secretion obtained by paracentesis of the unruptured membrane, have been made the subject of investigation by many eminent bacteriologists. Even in their hands results do not entirely agree. The chief questions are—

(1.) The cause of acute otitis media, whether it varies with the disease producing it?

(2.) The cause of the complications of chronic otitis media, whether they are dependent upon the same organisms as cause

the acute otitis, or whether they are dependent upon inoculation of the discharge from the air after rupture of the membrane in an acute attack?

(3.) Whether the complications respectively can be produced by the same organism, and whether or not one organism be more likely to give rise to one special complication?

In answer we get—

(i.) The organisms found in the discharge of acute otitis due to scarlet fever are streptococcus pyogenes, chiefly with staphylococcus aureus and albus (Blaxall); due to other causes, Zanzf and other observers ascribe, as more important, the pneumobacillus of Friedlander, and the diplococcus pneumoniae of Fränkel; Kanthack found diplococcus pneumoniae, staphylococci, streptococci rarely, and non-pathogenic bacteria.

It would appear, therefore, that the causes of acute otitis do vary.

(ii.) In chronic discharges the most common are streptococci, staphylococci, various non-pathogenic bacteria, and tubercle bacilli.

Kanthack found neither streptococcus pyogenes nor diplococcus pneumoniae in chronic cases. Moos found streptococci and Fränkel's diplococci in a secondary abscess, and streptococci in cholesteatomatous masses. Rohrer found that in non-fetid discharges saprophytic bacteria were absent, and their presence in fetid discharges is supported by other observers.

It is noticeable that Fränkel's diplococcus and the pneumobacillus of Friedlander are not generally present. This may be due to the acute otitis media of scarlet fever being more prone to last as chronic otitis than that due to other causes. It is also possible that cases originating from the diplococcus and pneumobacillus may be subsequently inoculated with streptococci and staphylococci, which may prevent the further growth of the organisms originating the acute attack.

(iii.) Zanzf, Netter, Scheibe, and Moos all give streptococcus pyogenes as the important factor in the production of the complications of otitis media. Clinically we should be inclined to say that all the complications can result from the same organism, for these reasons:—

(a.) That infection can spread from the middle ear and give rise to all three major complications at one time, by direct continuity or otherwise.

(b.) That whether a single complication or more be present, the pus in them resembles that of the ear-discharge in naked-eye characters, and in the presence or absence of foetor.

We may go further and say, that as the same organisms have been found in acute and chronic discharges, and we know that any of the complications may result from an acute otitis, that it may be the same organism producing the complication in each case, whether streptococcus, staphylococcus, or others known to give rise to acute attacks of otitis media. The time has not yet come for us to be able to state definitely whether or not one organism be more likely than another to give rise to either abscess, meningitis, or thrombosis of sinuses. To do this will require further bacteriological investigation, through a long series of cases, of the ear-discharge and of the pus of each complication respectively, especially should they occur concurrently in one case. It may yet be reserved for future investigation to show that though each lesion in the same case may contain the organisms present in the ear-discharge, yet in meningitis one organism will preponderate over the same or other organism in the abscess, or in the thrombosed sinus, with or without relation to the preponderance of that over other organisms in the ear-discharge, and that each organism may essentially give rise to a definite lesion, preponderating in number over other organisms present in the same lesion, because the soil, the lateral sinus for instance, is more suitable for its development than for the development of others, whereas should inoculation of the mixed organisms take place in other soil, the brain or meninges, the organism prominent in the lateral sinus finds the soil here not so adapted for its development, and has to take an inferior position in the great struggle for existence.

MM. Brouardel and Josue (Gazette des Hôpitaux, April 2, 1895) relate a chronic case of cerebral abscess in which, after a most careful examination, they were unable to find any organisms whatever. No cause could be found for the abscess, but they inclined to the view that there might have been some ear-disease previously which had cleared up and left no trace of its previous presence, and that after the formation of the cerebral abscess the organisms producing it had been also absorbed. They also suggest the absence of organisms may account for the absence of symptoms the case exhibited.

This is an interesting case, and, as far as I am aware, a unique one. As acute abscesses containing organisms may give rise to no symptoms of importance, the absence of organisms cannot account for absence of symptoms in all cases.

MIXED CASES.

Combinations of the lesions under consideration occur thus :

(a.) Abscess with thrombosis of sinuses or meningitis, or with both.

(b.) Thrombosis of sinuses with meningitis.

When associated with other lesions the meningitis is secondary, and its influence in altering symptoms will depend on the early or late occurrence of it as a complication of the primary lesion, and the earlier symptoms of this primary lesion may not be observed at all, should the case come late under observation. The alteration in symptoms will also depend upon the extent of the meningitis, whether localised or general.

On study of cases, we find that symptoms of thrombosis and meningitis hide those of abscess, and that when meningitis occurs with thrombosis, it alters to some extent the course of the thrombosis.

As already mentioned, it is sometimes extremely difficult to diagnose even uncomplicated cases of lesions, from absence of symptoms or alterations in temperature charts, and an increased difficulty is met with if these cases which give rise to but few symptoms become associated with other lesions which effectually mask those symptoms. We cannot diagnose these mixed cases from any one or two symptoms. A general view of the case must be taken. In mixed cases the symptoms due to meningitis or thrombosis become prominent, and should an abscess be present in addition, we must not expect definite symptoms from it, except it be in a position to produce aphasia or hemiplegia. The symptoms already enumerated in detail for each lesion must be weighed with all due care, and as I have already shown what may be deduced from a study of temperature charts and pulse records in pyæmia, so here again I think these indications are of value in differentiation of mixed lesions, or at least in appreciating the condition present. Which of the three is producing the predominant symptoms. A chart from a case of a large temporo-sphenoidal abscess involving the frontal and parietal lobes as well, showed an irregular temperature, varying from 99° to 104° , with two rises to 105° (rigors), and only two falls to normal in the space of five weeks. The chief elevation was after operation on fifth day after admission to hospital. The size of the abscess, and the fact that it had been operated on, may account in some degree for the elevation of temperature the chart shows. Two rigors

were seen during the case, and there was the trephine-hole allowing a continuous drainage. It has been suggested by Barker that in abscess some product by its absorption prevents elevation of temperature. This constant drainage would remove this product, or at least lessen the tendency to absorption of it, and allow elevation of temperature, as in inflammation elsewhere in the body. The chart serves to illustrate that the temperature may run high in an abscess uncomplicated by meningitis or thrombosis of sinuses, at least with the presence of a drain for the pus, though probably in this case it was inefficient, as the abscess spread after operation. For diagnostic purposes such a case may be almost excluded, for it is rare to be brought face to face with an abscess of such magnitude. Consider the appended illustrative case of abscess (Case III. p. 185), together with its temperature chart. The chart showed a well-marked rise with a rigor, followed by a fall and an operation next day, at which the lateral sinus was exposed and the internal jugular vein tied, therefore cutting off any source of infection of the general system by way of this channel. Until the 8th the temperature remained a little above normal with falls below, due, we may take it, to the influence of the abscess allowed play by cutting off of infective material by ligature of the vein, whilst the pulse-rate on the 6th reached its lowest level. After the 8th the temperature gradually rose to the 12th, when it remained high till the 18th. In addition, the pulse-rate increased a little from the 7th onwards to the 17th, and then on the 18th fell with the temperature, rising again after this out of proportion to rise of temperature, ushering in death. The post-mortem note states, "No evidence of general pyæmic infection," and we may therefore conclude the ligature of the vein stopped the supply of infective material, thus accounting for the absence of irregular temperatures and rigors. Had there been any infection from the thrombosed petrosal sinuses carried by the untied jugular vein, I think it would have given evidence of its occurrence by rigors and more elevated temperature. Definite symptoms and signs of meningitis are first noted in the records on the 12th, and I think from these considerations we can deduce that the rise of temperature from the 8th onwards to the 18th was due to meningitis, and that it was the cause also of the increase in frequency of the pulse. It therefore follows that meningitis can raise the temperature and increase the pulse-rate in the presence of an abscess, as it does when such a lesion is absent.

Again, in a case of cerebellar abscess associated with thrombosis of the lateral sinus and meningitis, the temperature chart

was entirely changed from a typical one of abscess. The first five days are marked by an irregular temperature, with one rigor suggestive of pyæmia, and then onwards to death the temperature remains raised at an elevated level. In this case, three weeks before admission temporary attacks of giddiness occurred, and definite symptoms began five days previous to admission into Hospital. If we had seen the temperature chart for these five days, it would probably have had the same characters as one of pyæmia, for it seems probable that the abscess in the cerebellum arose secondarily to the thrombosis of the lateral sinus, as post-mortem it had all the characters of an acute abscess. It shows, therefore, that a cerebellar abscess was prevented from producing its normal depression of temperature by the presence of a septic thrombosis of the lateral sinus. It might be suggested that meningitis, when associated with lateral sinus thrombosis, as in this case, prevents the occurrence of rigors due to the latter lesion, for the two charts did not show the presence in ordinarily marked degree. But I do not think this is so, for in each of these two cases* there was sufficient evidence derived from the post-mortem examination to show that the breaking-down thrombus had been prevented from entering the general circulation by surrounding protective thrombosis. It is to the presence of this protective thrombosis, and not to meningitis, we must ascribe the absence of rigors. When meningitis arises secondarily from the thrombosis, we should rather expect the absence of rigors, for it arises by spread of inflammation through the visceral wall of the sinus to the meninges, and this takes place opposite the centre of the thrombus, where the breaking-down process in the sinus is farthest advanced, this process not having advanced far enough along the protective thrombus to admit of portions of infective clot being washed off into the general circulation to produce rigors. But, of course, rigors may be present with the meningitis if the onset of that lesion does not take place till the establishment of the secondary series of rigors, as discussed under pyæmia. On the other hand, should the meningitis arise from rupture of the abscess into the meninges, the presence or absence of rigors during the course of the meningitis will depend upon the condition of the lateral sinus, provided the rupture of the abscess does not cause immediate death.

These considerations are, I think, sufficient to show that, as a rule, meningitis and thrombosis of sinuses mark the symptoms of the presence of an abscess, with of course the marked exceptions above mentioned.

From the details thus given it will be seen that uncompli-

cated cases of the lesions under consideration, having well-marked symptoms, present sufficient indications for a correct diagnosis, but from the ease with which complications ensue, and symptoms are absent or altered, difficulties arise, to overcome which it is necessary to take the symptoms not separately, but in conjunction, having special regard to the course of the temperature, the onset of the illness, the presence or absence of rigors, delirium, paralysis, or convulsive movements, and the occurrence of any special symptoms previously enumerated, always remembering that two or more of the lesions discussed may be present together, and being at the same time careful to exclude extracranial sources of symptoms already mentioned.

The combination of symptoms with any special characters they carry with them may lead aright, when consideration of them separately may give no clue.

Failing to diagnose, the only resource is an exploratory operation to endeavour to investigate the cause of existing symptoms and to relieve them. If unsuccessful, there remains the feeling that the best was done for the patient under the adverse circumstances, and that every failure is an opportunity of adding to knowledge and experience for the profit of those who follow us.

ILLUSTRATIVE CASES.

CASE I.—*Septic Thrombosis of Lateral Sinus.*

J. H. M., 29, male, admitted to St. Bartholomew's Hospital, July 5, 1895.

History.—Never had a previous illness similar to the present one. Discharge from left ear for eighteen years, and from the right ear three years ago. Fourteen days previously, noticed to be dull and not in his usual spirits, but no complaint was made. Ten days previously, pain in the head, which continued till June 28th (seven days ago), when there was a discharge of pus from the left ear. Six days ago rigors, and two every day up to admission, with the exception of July 3rd, when there were none. Some of these lasted as long as thirty-five minutes. Five days ago vomited, and this repeated at intervals.

On admission.—Dull; answers rationally. Jaundiced. Constant pain left frontal and temporal regions. Pupils dilated and do not react (atropine to eyes two days ago). Left pinna a little prominent. External and anterior jugulars more prominent on the left than on the right side. No œdema over mastoid, and no marked tenderness, except at the posterior

superior aspect of the bone. Well-marked tenderness below the external auditory meatus and down the left side of the neck, more marked higher up, and more fulness on this than on the opposite side.

Non-fetid but sour-smelling pus from the left ear, and a perforation of the membrana tympani.

No paralysis of any cranial nerves; no optic neuritis. Pulse, 96; dicrotic, regular, and full. Temperature, 99.2°. Tongue coated with white fur, and dry on tip and centre. Two rigors to-day. Bowels opened yesterday; motions rather light in colour.

July 6th.—Five rigors since admission. Temperature this morning, 105.4°. Lungs natural; heart, soft systolic apical murmur; abdomen slightly distended. Complains of pain in left hypochondriac region. Petechial spots distributed all over body.

Operation.—Sinus exposed; fetid pus removed; thrombus extended as far back as end of horizontal portion; below this was foul dirty pus in the sinus. The internal jugular vein was exposed; found very small, and ligatured.

July 7th.—One slight rigor last night; restless this morning, and crying out with pain in left side, at which spot was an area of consolidation with friction rub; tongue protruded a little to the left; more petechial spots; had to be nasal fed at night.

July 8th.—Lung consolidation considerably increased; weaker; pulse and respiration increasing in rapidity; has not strength to expectorate. Rallied a little about midday, but then rapidly sank, and died four hours later. No post-mortem examination permitted.

CASE II.—*Extradural abscess and suppurative meningitis.*

W. H. P., male, 18, admitted to Hospital, August 29, 1895.

History.—Discharge from both ears off and on for seven years. Discharge often fetid.

August 20th.—Felt ill, vomited; complained of pain in back of head, and is said to have shivered; no previous alteration in character or amount of discharge from the ears. During the next few days no vomiting, rigors, or definite symptoms; pain shifted from occipital to frontal region on application of mustard poultices to the neck.

August 29th.—Fit; never any previously. According to history, both sides of face twitched, the mouth being drawn to the left; both arms and legs also twitched. More similar fits, lasting one or minutes, occurred during the day; bowels open.

On admission (10 P.M.).—Is said to have “wandered” lately,

and to have spoken more slowly; never any similar fits previously. Tongue moist and slightly furred. Lies on right side with knees flexed; says it is the most comfortable position. Speaks slowly after apparent thought (has always spoken rather slowly). Pupils equal and react. Complains of right frontal and temporal headache; greatest intensity about $1\frac{1}{2}$ inches behind and above the external angular process of the frontal bone; tenderness on percussion absent except at this spot.

No paralysis of any cranial nerve. Grasp, both hands equal but weak. Knee-jerks markedly increased. No retraction of the neck. Ears, purulent fetid discharge from both, much more from the left than the right; membranes almost gone and granulations prominent. Tenderness beneath both ears between angle of jaw and mastoid. No oedema or tenderness of the mastoid, and none along the course of the jugular veins. Pulse 97.

Lungs: Nothing abnormal.

Heart: Impulse diffuse. Presystolic and systolic apical murmurs.

August 30th.—Two fits at 2.30 and 3.30, duration half a minute. Face twitched, and also arms and legs, which were rigid. No optic neuritis. At 4 P.M. fit lasting one minute; mouth drawn to left, and head a little deflected to the left; both sides of face twitched; arms and legs twitched and rigid equally on both sides.

August 31st.—Condition unchanged; knee-jerks increased; very drowsy.

September 1st.—There has been no vomiting. Knee-jerks absent; optic neuritis found in both eyes, more marked on left. Passed urine under him. At night pulse was 60, with a temperature of 101° .

September 2nd.—Worse; more drowsy but conscious, and answers questions. Temperature remains raised.

Operation.—Right mastoid chiselled till membranes exposed. No sign of inflammation, and they pulsated. Trephined $1\frac{1}{2}$ inches above meatus. The bone oozed pus on cutting, and an extradural abscess was evacuated. Three ounces of foul pus escaped, dura being sloughy. It was deemed inadvisable to open to dura mater, because of the chance of setting up purulent meningitis if this had not already occurred. The pulse increased after evacuation of the abscess. At night was restless, the temperature remaining elevated.

September 3rd.—A little improved; passes urine unconsciously. Temperature, 100.8° . Knee-jerks obtained with much difficulty. Left facial paresis. Sleeps with left eye open,

but can close it voluntarily. Dressed. At night retraction of the head; less conscious.

September 4th.—Rigor at 2 A.M. Right pupil greater than left; retraction of neck more marked. Does not voluntarily move the left arm and leg, but can do so on request. Moves right limbs freely. Left knee-jerk markedly increased, and ankle-clonus. Right obtained slightly, but no ankle-clonus. Pulse not so good. Does not complain of pain. Neuritis increased. Later became semi-unconscious. Had a slight rigor, followed by harsh and stertorous breathing, with temperature rising to 105.6° at death.

Post-mortem.—Whole scalp œdematous, especially posterior part. Around the trephine-hole was a quantity of foul-smelling pus between the bone and dura mater. On removing dura, the whole of right hemisphere bathed in pus, which extended a little across the middle line to the left frontal lobe in front. Much pus at the base of the brain, in the middle fossa between dura and arachnoid, and dura and bone. The pus had passed down between the medulla and pons. Bone forming the roof of right tympanum was completely carious, and there was a mass of somewhat caseous foul pus around it. Left tympanic roof healthy. No abscess in the brain, but the cortex over area of inflammation softened and discoloured. Remainder of the organs healthy.

CASE III.—*Right chronic otitis media—Septic thrombosis right lateral sinus—Left temporo-sphenoidal abscess—Purulent basal meningitis.*

A. B., male, 16, admitted to Hospital, December 4, 1893.

History.—June 1892.—Kicked on right ear.

August 1892.—Discharge from it continuous since.

November 24, 1893.—Shooting pains right mastoid.

November 30.—Headache, giddiness, and rigors.

December 3.—Temperature 104° .

December 4.—*On admission.*—Drowsy. Right frontal headache. Painful spot over right mastoid and tenderness along course of internal jugular vein. External auditory meatus filled with inspissated pus. Perforation of membrane and granulations. Giddiness. Rigor. No optic neuritis. No strabismus.

December 5.—*Operation.*—Mastoid cells (right) chiselled and pus evacuated. Lateral sinus opened. No pus or clot found, but it bled slightly. Internal jugular vein tied.

December 6 and 7.—Improved.

December 8.—Headache.

December 11.—Diplopia. Slight convergent strabismus of right eye.

December 12.—Distinct right convergent strabismus. Dilatation of right pupil. Both eyelids swollen, especially right side. Never entirely lost pain since operation, and is now worse. No optic neuritis. Temperature rising.

Operation.—Lateral sinus exposed more fully and right temporo-sphenoidal lobe explored, but nothing found.

December 13.—Muscular tremors left hand and eyelid. Intermittent pulse. Retention of urine.

December 14.—Strabismus increased. Both pupils equal and react.

December 15.—More swelling of eyelids and right eye intolerant of light. Delirious. Both discs choked.

December 16.—More delirium; incontinence of urine and fæces.

December 17.—Swelling round eyes gone. No strabismus. Less drowsy.

December 20.—Strabismus again. Facial spasms left side of face. Right eye does not close completely. Tongue protruded to right. Slight convulsion on right side of head and neck. Tongue drawn to right and protruded. Death.

Post-mortem.—Emaciated. No convex meningitis. Left temporo-sphenoidal lobe was fixed into the middle fossa, especially at the apex, and was partly lacerated on attempted removal. Much yellow purulent lymph beneath the lobe, and also about the pons. No meningitis about right temporo-sphenoidal lobe.

Sinuses: Right lateral sinus filled with purulent clot down to the jugular fossa, but not extending backwards along horizontal portion. Extension of clot along right inferior petrosal to right cavernous, and thence into left cavernous by circular sinus. Left lateral sinus free from clot.

Right tympanic cavity lined with carious bone, and free communication with right lateral sinus. The left tympanic cavity quite free from disease. Meningitis at base, most marked on the left side.

Brain: Left temporo-sphenoidal lobe was distended into a bag containing slightly offensive pus.

Chest: Ten ounces of clear fluid in the left pleura. Lungs congested.

No evidence of general pyæmic infection.

CASE IV.—*Left otitis media—Extradural abscess—
Cerebellar abscess—Meningitis.*

H. S., male, 11, admitted to Hospital, July 16, 1895.

History.—Ten days ago pain and swelling behind left ear.

Incision. Three days later another incision; pus evacuated.

Constant vomiting last few days.

On admission.—Could not walk. Complained of pain in head. Appears dazed; is conscious, answers questions, but exhibits slow cerebration. Knee-jerks absent. Pupils equal and moderately dilated. No paralysis. Occipital headache. Pulse 58, full. Fundus of eyes engorged.

Operation.—Extradural abscess in posterior fossa evacuated. About one drachm of pus obtained. Later very restless and complaining of pain in head.

July 17.—No vomiting since operation.

July 19.—Worse. Pulse very slow. Very restless. Much vomiting. In evening convulsion; back curved backwards and rigid. Another similar attack later.

July 20.—Pulse quicker. Vomited.

July 21.—Died collapsed in afternoon.

Post-mortem.—Large hole behind ear, and at bottom of hole an aperture one-eighth of an inch in diameter. Cerebellum opposite the hole was adherent for size of sixpenny-piece. Opening led through this into a large abscess in left lobe of cerebellum containing an ounce of greenish pus.

It was situated in the outer part of the cerebellum, and did not encroach at all upon the medulla, pons, or cranial nerves. It could easily have been reached from the wound, the layer of brain covering it being very thin. In the posterior fossa was a small amount of turbid serum. All the other parts of brain and membranes perfectly normal, with the exception of a spot just above the tympanic cavity where the dura mater presented a second small ragged opening; brain, however, not yet affected.

Sinuses: Right lateral very much dilated. Left lateral very small, though just patent, and evidently the seat of old thrombosis.

The left internal jugular vein was very small, and the right large.

STATISTICAL TABLES.

In all of these R=right ear, L=left ear, M=male, F=female, and ?=unstated.

TABLE I.—*Statistics of Pyæmia.*

Pyæmia	Without thrombosis	15 (4 had extradural abscess)	100	{	M 61	R. 33
	?	10				? 5
	With thrombosis	75 (61 lateral sinus, and 14 lateral with others				L. 23
		27 extradural abscess, 15 meningitis)				R. 7
					{	? 1
						L. 2
					{	R. 11
						? 3
					F. 29	L. 15

Total R. 51 and L. 40. Notice left ear affected more in females and right in males, and that the lesion is commoner in males.

TABLE II.—*Double Otorrhœa occurred 13 Times in 100 Cases.*

13	{	R.	7	{	M. 4	. .	(with thrombosis, ? 1).
				{	F. 2	. .	(both with thrombosis).
	{	?	2	{	M. 1	. .	(both with thrombosis).
				{	F. 1	. .	
	{	L.	4	{	M. 2	. .	(one with thrombosis, and one without).
				{	F. 2	. .	(both with thrombosis).

The incidence of the complication on the right ear will be noticed.

TABLE III.

Age.			
1-10	32	{ 100 {
11-20	. . . . .	29
21-30	. . . . .	21
31-40	. . . . .	8
41-50	. . . . .	2
51-60	. . . . .	3
61-70	. . . . .	0
71-80	. . . . .	1
Unstated	4	

(Commonest in the first ten years of life, with decrease in each subsequent decade.

TABLE IV.—*Duration of Otorrhœa.*

Acute	15	{ 100.
Under one year	17	
Above one year	58	
Unstated	10	

TABLE V.—*Comparison of Deaths and Recoveries of Right and Left in the 100 Cases.*

Operation on sinus or jugular vein . . .	42	$\left\{ \begin{array}{l} \text{Recovery . . . 29} \left\{ \begin{array}{l} \text{R. 16} \\ \text{L. 13} \end{array} \right. \\ \text{Death . . . 13} \left\{ \begin{array}{l} \text{R. 9} \\ \text{L. 4} \end{array} \right. \end{array} \right.$
Unstated whether or not any operation . . .	3	$\left\{ \begin{array}{l} \text{Death . . . 3} \left\{ \begin{array}{l} \text{R. 3} \\ \text{L. 3} \end{array} \right. \\ \text{Recovery . . . 7} \left\{ \begin{array}{l} \text{R. 4} \\ \text{L. 3} \end{array} \right. \end{array} \right.$
No operation	46	$\left\{ \begin{array}{l} \text{Death . . . 39} \left\{ \begin{array}{l} \text{R. 22} \\ \text{L. 17} \end{array} \right. \end{array} \right.$

Side of complication ? in 9.

Right ear cases 51 with 31 deaths, and left ear cases 40 with 24 deaths.

Of the 31 deaths, thrombosis is spontaneously or on ligature of vein in 26, none in 4, and ? in 1.

Of the 24 deaths, with thrombosis in 20, none in 3, and ? in 1.

In 51 R. cases, thrombosis followed by death occurred in 26, $\frac{51}{26}$: practically $\frac{2}{1}$.In 40 L. cases, thrombosis followed by death occurred in 20, $\frac{40}{20}$: $\frac{2}{1}$.TABLE VI.—*Statistics of Meningitis (20 Cases).*

(a)	20	$\left\{ \begin{array}{l} \text{M. . . 10} \\ \text{? . . 2} \\ \text{F. . . 8} \end{array} \right.$
(b)	20	$\left\{ \begin{array}{l} \text{R. . . 7} \\ \text{? . . 7} \\ \text{L. . . 6} \end{array} \right.$
(c)	. . .	Double otorrhœa in 6 $\left\{ \begin{array}{l} \text{R. . . 1} \\ \text{? . . 3} \\ \text{L. . . 2} \end{array} \right.$
Age.		
(d)	20	$\left\{ \begin{array}{l} \text{1-10 . . . 10} \\ \text{11-20 . . . 8} \\ \text{21-30 . . . 1} \\ \text{31 . . . 1} \end{array} \right. \left\{ \begin{array}{l} \text{Youngest 11 months. Oldest} \\ \text{31 years. Commonest in} \\ \text{first ten years of life.} \end{array} \right.$
(e)	Duration of otorrhœa.	
	Acute 6, remainder 2 to 10 years.	

TABLE VII.—*Statistics of Abscess.*

100	{	Cerebellar . . .	33	Temporo-sphenoidal	54
		Cerebral	67	Temporo-sphenoidal, frontal, occipital, parietal	5
				Temporo-sphenoidal (1 abscess) and cerebellum (1 abscess)	2
				Temporo-sphenoidal (1 abscess) and occipital (1 abscess)	2
				Frontal	2
				Occipital	1
				Fourth ventricle	1

TABLE VIII.

100	{	M.	60	{	R.	29	} Males predominate.
		?	4		?	1	
		F.	36		L.	30	
					R.	23	
					L.	13	

TABLE IX.

100	{	R.	56	}	Right side more affected.
		?	1		
		L.	43		

TABLE X.—*Double Otorrhœa in 14 Cases of the 100.*

14	{	R.	8	{	M.	4	} Right side and males predominate.
		?	1		?	1	
					F.	3	
					M.	1	
		L.	5		M.	3	
					F.	2	

TABLE XI.—*Duration of Otorrhœa.*

(a) Cerebral	{	Acute	4	}	(Longest duration over 30 years).
		1 year	11		
		Above 1 year	45		
		Unstated	7		
(b) Cerebellar	{	Acute	5	}	(Longest over 30 years).
		1 year	4		
		Above 1 year	22		
		Unstated	2		

TABLE XII.

(a) Cerebral—

67	{	R.	33	{	M.	18	} Double otorrhœa in 9
		?	1		F.	17	
					M.	1	
		L.	31		L.	3	
					M.	20	
					F.	11	

(b) Cerebellar—

33	{	R.	21	{	M.	11	} Double otorrhœa in 5 $\frac{1}{4}$
		?			?	4	
					F.	6	
		L.	12		L.	2	
					M.	10	
					F.	2	

TABLE XIII.

(a) Cerebral—		(b) Cerebellar—	
Age.		Age.	
67	1-10	33	1-10
	11-20		11-20
	21-30		21-30
	31-40		31-40
	41-50		41-50
	51-60		Unstated
	Unstated		
	6		4
	19		14
	23		5
	8		3
	4		1
	1		3
	6		

TABLE XIV.—*Vomiting.*

Occurred in 18 cases of 33 cerebellar, and of these 18, 5 had thrombosis and 13 none, and in 33 cases of 65 cerebral, and of these 33, 5 had thrombosis and 28 had none. If the cases of vomiting in cerebellar abscess be raised to 33, we get (omitting fractions) that of 33 vomiting cerebellar cases 9 had thrombosis and 24 had none. Now of 33 vomiting cerebral cases, 5 had thrombosis and 28 had none, therefore there is a greater association of thrombosis with vomiting in cerebellar abscess.

TABLE XV.—*Optic Neuritis.*

In 109 pyæmia, it is mentioned in 47	{	Absent in 16
	{	Double in 26
	{	One side in 5
In 20 meningitis, it is mentioned in 12	{	Absent in 5
	{	Double in 7
In 100 abscess it is mentioned in 46 (35 cerebral and 11 cerebellar)—		
In 35 cerebral	{	Absent in 10
	{	Double in 18
	{	One side in 7
In 11 cerebellar	{	Absent in 4
	{	Double in 5
	{	One side in 2

Assuming absence in cases where no mention of it occurs, we should get it present—

31 times in 100 cases of pyæmia.
 35 times in 100 cases of meningitis.
 32 times in 100 cases of abscess.

In the 25 cases of abscess in which it was present, 1 case had thrombosis of sinuses, 5 meningitis, and 1 had both of these lesions.

THE GROWTH AND WORK OF THE PATHOLOGICAL DEPARTMENT OF ST. BARTHOLOMEW'S HOSPITAL.

BY

F. W. ANDREWES, M.D.

The development of scientific pathology has been perhaps the most important factor in medical and surgical progress during the latter part of this century. This Hospital has been not only amongst the first, but in some respects actually the first in London to take advantage of the growth of this subject, both in keeping its teaching abreast of the times, and in availing itself of the most modern pathological methods in clinical diagnosis. It may therefore be of interest to trace, in a few words, the evolution of our Pathological Department, and put upon record the stages by which its present position has been attained, together with a short account of the work now carried on therein.

It is proposed to deal only with modern times, commencing with the opening of the present school buildings and museum. It would be needful to delve into antiquity to trace the beginnings of pathological study at this Hospital. From the time when post-mortem examinations were first systematically carried out,¹ and from the earliest days of our Museum,² morbid anatomy has been a constant study. For long this was the only branch of pathology which was pursued in any detail: even within the memory of the writer, morbid anatomy formed the staple material of the lectures on pathology. I do not believe that to-day

¹ Our present post-mortem records date back only to 1867, but there are accounts of autopsies in the volumes of old ward notes which date from 1820, and post-mortem examinations are known to have been performed here 200 years ago.

² The oldest known specimens in our Museum date from the time of Percivall Pott, about 1756, but the Museum was founded in 1726. See an interesting paper by Mr. F. S. Eve on "Our Museum and its Associations," *St. Bartholomew's Hospital Reports*, vol. xvii. p. 165.

this subject is more attentively or better studied, in its naked-eye aspects, than it was twenty or thirty years ago—perhaps even less so. But this is only because new and more refined methods have been introduced, which have shed a far brighter light on the subject. The pathologist of other days could, for example, recognise his tubercle by eye and touch alone: he cultivated these powers to the utmost, and was not often wrong. But to-day he can supplement them by histological study, and the demonstration of the tubercle bacillus, or even by inoculation experiments. His conclusions may attain practical certainty: instead of one crude mode of diagnosis, he has several refined ones. It has been feared by some that naked-eye pathology may thus come to be undervalued; but I do not think this is the case at St. Bartholomew's. It is true that no great recent advances in its study can be recorded here; but in the teaching of it, and in the permanent specimens which illustrate it in our Museum, very important progress has been made.

It will be of interest first to trace the development of microscopical pathology at St. Bartholomew's. When the present Museum was built, the collection was re-catalogued by Mr. Eve, who was then Curator: he and Mr. Walsham examined many of the specimens microscopically, and determined their true nature for the first time. Something had, indeed, been done in this direction by earlier Curators, notably by Sir James Paget, who had been responsible for the catalogue of the Museum published in 1846, and also by Mr. Marrant Baker. But from this time forward the great bulk of new specimens added were microscopically examined, and at the present day a microscopic section of every specimen placed in the Museum is preserved for future reference as a matter of routine—a valuable practice, first systematised by Dr. Kanthack. Even now a large number of the older specimens in the Museum are without a microscopic diagnosis, and every year, as they are gradually cut, errors in description are being one by one corrected.

It has never been the duty of the Curator of the Museum to report upon the microscopic diagnosis of the tumours and other material removed in the operating theatres or revealed in the post-mortem room, save in so far as they were worthy of permanent preservation. This duty has on the surgical side devolved upon the Surgical Registrar, being, as I imagine, at first voluntarily undertaken, and becoming, as its utility was made manifest, a routine practice. There is probably no part of the duties of the Registrar which is of more immediate value to himself than the direct correlation of clinical observation with exact pathological fact which this work involves. On the medical

side there has been no one upon whom the routine microscopic examination of post-mortem material officially devolved, though for many years it has been willingly undertaken by the Pathological Department so far as was possible.

In October 1881 Mr. Bowlby was appointed Curator of the Museum. There was at this time an ever-growing demand for the microscopic diagnosis of tumours, and it appears that a considerable amount of this work overflowed from the Surgical Registrar, and fell upon the willing shoulders of the Curator. There was no official place in which the work was done, but there soon came to be one. The room which now serves as the pathological laboratory never formed any part of the physiological class-room, in spite of the sliding doors between them. It was intended for the use of the staff in any work they might desire to carry on, and it was very properly appropriated by Dr. Norman Moore, Mr. Eve, and Mr. Bowlby for the purposes of microscopic pathology. The screen which still cuts off one corner of the room was erected for Dr. Norman Moore. Students were found who were glad enough to act as pathological clerks, and undertake the mechanical work of preparing the sections, since they received in return valuable instruction in microscopic diagnosis, and had the opportunity of amassing useful and extensive collections of specimens. Dr. Norman Moore had already, in 1879, inaugurated weekly demonstrations of morbid anatomy in the post-mortem room, and they are still carried on in much the same way. In the same year similar demonstrations in microscopic pathology were started by him in conjunction with Mr. Eve, and later with Mr. Bowlby; they were held once a week, on Friday afternoons, as they are still held at the present day. The pathological clerks cut and stained the sections, and they were handed out to the class in clove oil, after a short preliminary discourse by the demonstrators.

The present writer acted as clerk in the department for some two years in 1885-86, and retains as a memento of his work there, not only a large amount of useful experience, and a number of pleasant recollections, but also a large collection of specimens which are still of value and interest. The methods of section-cutting were less delicate than those now employed. We used only the tedious and clumsy method of freezing the tissues with ice and salt in a "Williams" microtome. Now-a-days the first thing the pathological clerk is taught is the use of the rocking microtome and the art of embedding in paraffin. There can, of course, be no comparison between the two methods, not only as regards the quality of the sections, but also in the

ease and readiness with which they are prepared. The range of available dyes and staining methods is also now vastly more extensive ; but in spite of all this, we managed to turn out very fair sections.

In 1884 Mr. Bowlby became Surgical Registrar, and, while he continued to carry on the microscopical work above described, he inaugurated also the weekly demonstrations on surgical morbid anatomy which he carries on to the present day. For two years these were unofficial, but in 1886 he was officially appointed Demonstrator of Surgical Pathology.

Meanwhile an entirely new branch of pathology was growing up: bacteriology was being discovered to have increasingly important bearings on medicine and surgery. In this country the name of our Lecturer on Physiology—Dr. Klein—will always be remembered as one of the earliest, as he has been one of the most brilliant and successful, workers in this field. His book on “Micro-organisms and Disease,” as it originally appeared in its first edition, reprinted from the pages of the *Practitioner*, enjoys the credit of being the first book on bacteriology which was ever published in any language. About 1886 he held a small class in bacteriology ; but it had no connection with the Hospital, being held at the Brown Institute, where he was then working, and it was not till 1892 that he was officially appointed to teach the subject at St. Bartholomew’s. Meanwhile, however, the subject was being pursued here, and ultimately taught. Not long after Koch’s discovery of the tubercle bacillus in 1882, sputa were being examined for this organism in the Pathological Laboratory: in 1885–86 we frequently had sputa sent up from the wards for this purpose. The first systematic instruction in bacteriology was begun about 1887 by Dr. Vincent Harris and Mr. Lockwood, who continued to hold classes up to 1892, when the Public Health Laboratory was instituted, and placed under the charge of Dr. Klein, who in that year transferred his bacteriological work from the College of State Medicine to the Hospital. He then became the official teacher of bacteriology and conducted courses for the diploma of Public Health.

A very important change was now at hand in the position of pathology at St. Bartholomew’s. Hitherto the different branches of the subject had been practised and taught in different departments, which had no necessary connection with each other, by different members of the teaching staff, each of whom devoted only a portion of his time to the subject. In view of the rapid development which the science had undergone in recent years, a feeling grew up amongst many members of

the Hospital staff that the time had now come to centralise the pathological work and teaching in the hands of one man, who should devote himself entirely to the subject. The plan was not carried out without opposition, and it cannot be doubted that its successful issue depended largely on the fact that at the time there was a St. Bartholomew's man, already known as a rising pathologist, who was both competent and willing to undertake the work. Dr. Kanthack had devoted much of his time as a student to pathological work. Later, he had studied in Berlin under Virchow and Koch, and having held office on the junior staff of the Hospital, had become well known to the authorities. He was induced to offer himself for the post of Lecturer on Pathology at St. Bartholomew's, and was appointed in 1893, on the understanding that he should devote himself altogether to the subject. This Hospital may claim the credit of being the first in London to create a post of the sort, and it may also congratulate itself on the sagacity with which it chose the first incumbent of that post, for no man could have been selected who would have been more successful in developing its possibilities.

The duties of the lecturer on his appointment were to lecture officially in the summer session and to conduct the classes in microscopic pathology during the winter. The number of lectures was increased from one to two a week, and their character was considerably modified: they were no longer lectures on morbid anatomy only, but became essentially lectures on general pathology, in which the facts of morbid anatomy and pathological histology, learned elsewhere—in the dead-house and at the microscope—received their summing-up and explanation. The winter classes were carried out on the same lines as heretofore, though improvements were ultimately brought about by the introduction of more modern methods of section-cutting.

The pathological laboratory was handed over to the lecturer. It is alleged to have contained two mounted needles, a duster, and a broken microtome. The apparatus previously used had been the personal property of those who worked there, and a grant of £100 a year from the school funds was established for the upkeep of the laboratory, with a preliminary grant of £30 for the purchase of necessary apparatus. With this start Dr. Kanthack commenced work. He was permitted, with Dr. Klein's consent, to take the bacteriological classes, which had previously been carried on in the Public Health Laboratory, and Dr. Klein was good enough to lend a good deal of apparatus for the purpose. Material from the post-mortem room

was now much more systematically examined than before. The Surgical Registrar continued his microscopic work in the laboratory, and his labours received every assistance at the lecturer's hands.

By no means the least important part of Dr. Kanthack's work lay in the development of clinical pathology, a branch of the subject which he practically inaugurated at St. Bartholomew's, and which he developed by every means in his power. The help which might be derived from accurate pathological investigation of their cases was already appreciated by many of the staff, and "research clerks" had been for some time appointed to that end. They were, however, necessarily lacking in experience and in special training, and here was clearly a field in which great advances were possible. The research clerks themselves were benefited by a properly-equipped laboratory in which many researches, impossible in a ward, could be thoroughly carried out. Dr. Kanthack threw himself with energy into the clinical examination of blood, sputum, urine, and all the various morbid products which could throw light on the nature of a case. At first this was done unofficially, but the value and importance of the work became increasingly manifest, and at length received official recognition. In April 1895 Dr. Kanthack was appointed Pathologist to the Hospital by the Governors, and it became his duty to examine and report upon such material from the wards and out-patient rooms as was submitted to him by the staff. As new clinical methods were introduced they were tested and employed where they proved useful, and thus the examination of the throat for diphtheria bacilli, and the testing of the blood serum for the typhoid reaction, have become routine methods of proved value. The best evidence of the usefulness of clinical pathology lies in the increasing demand for it, and this has grown steadily, and is still growing. Most of the credit for this work at our Hospital must lie with Dr. Kanthack; he practically originated it, systematised and developed it, and it is now an integral and indispensable part of our Hospital organisation.

Another change in the direction of centralisation was made in January 1895, when the curatorship of the Museum became vacant; the Lecturer on Pathology was now made Curator. In this department Dr. Kanthack introduced several important innovations, the chief being the employment of the new methods of fixing the colours of specimens by means of formalin, and their preservation in glycerin. The enormous improvement which this method constitutes is patent to every one who has examined the preparations added to the Museum in recent years.

It may well be imagined that the amount of work thrown upon the Lecturer on Pathology by these various duties was very great, and it would indeed be impossible for a single man to attempt it without a considerable amount of assistance. Voluntary help has never been lacking. Students have always been found willing and anxious to serve as pathological clerks, and a short course of instruction soon renders them fully competent to carry on much of the routine work of the laboratory under due supervision. Dr. Kanthack's faculty for organisation was of great value in this respect. It became, however, increasingly evident that assistance in the department would have to be provided officially, and this was ultimately decided on.

In 1897 Dr. Kanthack left St. Bartholomew's to enter upon the wider field of professorial duties at Cambridge. He had done so much in so short a time, that the regret felt at his departure was very great, and his own regret was as great as any one's. Owing to the energy and labour which he had expended in developing the department, the task of his successor was very considerably lightened; and when the present writer took up the work in April 1897, he found little to do except continue it on the lines already laid down. Official assistance in the department was now instituted—a Demonstrator of Pathology, and two Assistant Demonstrators were appointed; and even before this an Assistant Curator of the Museum had been provided. The Research Scholarship in Pathology and Bacteriology, founded by our present Treasurer, has been of great value to the department as an incentive to original work.

A short sketch of the work now carried on in the Pathological Department may be of interest as a supplement to this imperfect account of its evolution. It is nearly all performed in the Pathological Laboratory, in which room considerable alterations and improvements have been carried out by the Hospital authorities during the past summer.

The clinical examination of material from the wards is done at the request of the member of the staff in charge of the case. Naturally, far more comes from the medical than from the surgical wards, since it is in the more obscure medical cases that such assistance is of special value. It is evident that as pathological methods become by experience easier and simpler, they become more and more part of the routine necessary to every medical practitioner. Thus it comes about that certain methods of clinical examination, which at first could only be done by specialists in the laboratory, are now taught to every

student, and are carried out in the wards. The detection of tubercle bacilli in sputum is a case in point; the estimation of hæmoglobin in the blood, and the counting of the blood corpuscles, is, or should be, another. The principle adopted in this Hospital is that such methods of clinical pathology as can be readily acquired by the student, and easily practised in the wards, should so be practised, and this principle not only saves the Pathological Department from unnecessary routine work, but is of obvious value to the students. A very large amount of necessary work can, however, only be carried on in the laboratory by specially trained persons.

Blood examinations are much in request. Simple blood-counts and hæmoglobin estimations are largely done in the wards by students or research clerks: the laboratory possesses the necessary apparatus, which is lent out for the purpose. The more difficult and delicate examinations, such as differential leucocyte counts or the detection of malarial parasites, are done in the laboratory. Such examinations are of the greatest value in obscure cases, and are not uncommonly decisive in diagnosis. Bacteriological cultivations from the blood are also frequently called for in cases of supposed septicæmia, and it is perhaps not sufficiently recognised that, while a positive result in skilled hands is conclusive, a negative result is of very little value in diagnosis. More commonly than not, one fails to find micro-organisms in the single drop of blood examined, even though the case be shown post-mortem to have been indubitably septicæmic. This is particularly true of infective endocarditis. The value of the serum reaction in the diagnosis of typhoid fever (see p. 205) has received abundant confirmation in our experience. Most cases of unexplained continued fever are now submitted to this test—a sufficient proof that its utility is appreciated. Special precautions are taken in the laboratory to maintain a good supply of well-tested typhoid bacilli for employment in the reaction; at almost every typhoid post-mortem cultures are made from the spleen and mesenteric glands, proved by every important test, and then laid down in bottle, as it were, for future use.

The routine examination of the sputum for tubercle bacilli is, and should be, mainly undertaken by the clinical clerks in the wards, at least on the medical side. In doubtful cases, and often from the surgical wards and the throat department, the matter is referred to the laboratory. The staining of sputum for other micro-organisms is sometimes asked for—*e.g.* for the pneumococcus, the influenza bacillus, and others.

Many samples of pus are sent up for investigation. The

specific organisms present—staphylococci, streptococci, tubercle bacilli, actinomyces—may have a very important bearing on diagnosis, prognosis, and treatment. Not uncommonly pus is submitted, with a request for information as to its source, and it is sometimes possible to indicate this with greater or less probability; faecal matter or hydatid remains may, for example, be demonstrable.

The urine is also a fertile field for investigation. The search for tubercle bacilli therein is at once the most frequent and the most laborious of the tasks propounded. The employment of the carbolic acid method of precipitation renders the process easier and more certain, but a good many negative results are needed to exclude their presence. Often, especially in cases of cystitis, other bacteriological inquiries have to be made. The routine chemical examination of the urine, including quantitative urea and sugar estimations, is almost always done in the wards. Nevertheless a fair number of cases are sent to the laboratory for investigation when any difficult or unusual question arises. The detection of small quantities of sugar, or of leucin and tyrosin, is too difficult to be properly carried out except in the laboratory. Abnormal pigmentation of the urine is also not uncommonly a matter submitted to the pathologist, nor is it usually an easy problem to unravel.

Bacteriological investigation of sore throats constitutes a large part of the work of the department, and is one of its most important and responsible tasks. From the diphtheria ward come cultivations not only for confirmation of diagnosis, but also for determination as to when patients may safely be discharged. Instances of sore throat arising in other wards are also often submitted for diagnosis, and in this way it has not rarely happened that cases of diphtheria arising in the Hospital have received a simple explanation. The most recent development of this line of research lies in the very large number of cases from the Casualty department in the Surgery which are sent up for diagnosis. When a House-Physician is in doubt as to whether he shall certify a case as diphtheria or not, he is always pleased to have the chance of placing some of his responsibility on other shoulders, and such help has always been gladly given, though it is not strictly included in the pathologist's official charge. The responsibility of such diagnoses is obviously very great, and their difficulty often extreme. It is not always fair that the bacteriologist should bear the whole burden of the diagnosis, for clinical considerations must often have considerable weight. There are bacteria which so closely resemble the diphtheria bacillus, that much time and toil are

needful to distinguish between them, and it is often impossible, even after twenty-four or forty-eight hours, to say more than that bacilli are present which are probably diphtheria bacilli. And since such bacilli may occur in normal throats, it is clear that the pathologist may justly demand full clinical particulars before committing himself to an opinion.

A common task set by the surgeon to the pathologist is the diagnosis of small pieces removed from tumours or ulcers as a guide to treatment. The surgeon is usually in a hurry; he sometimes wants an answer in an hour or two. Then there is nothing for it but rapid hardening of the tissue by boiling or by formalin or perchloride of mercury, and sections cut with a freezing microtome. A reliable opinion on sections thus rapidly prepared needs a good deal of practice, for the appearance of the tissues is so different from what is seen after ordinary preparation, that it is very easy to make serious mistakes. It is, nevertheless, usually possible to offer at least a tentative opinion, and one which is commonly correct. Where a day or two can be allowed for proper preparation of the tissue, a reliable answer can almost always be given. By hardening in Müller's fluid in the incubator at 37° C. for twenty-four hours, and rapid embedding in paraffin, satisfactory sections can be prepared in from two to three days, or even less, and the difference in clearness between such sections and those prepared by boiling is enormous. It is probable, however, that a man who devoted himself to the rapid method would, in time, acquire sufficient certainty to pronounce an authoritative opinion in a very short time. The trouble is that the fragment commonly submitted is too small to allow of a decisive opinion. The diagnosis of epithelioma, for instance, often demands evidence of infiltration of adjacent tissue by the growth, nor is it often possible to distinguish between sarcoma and granulation tissue when the fragment is very minute. Thus it not uncommonly happens that the answer of the pathologist is justly indefinite, and it would have been a truer kindness to the patient to have removed a larger piece of the growth for diagnosis.

The routine examination of tumours and other material removed in the operating theatres is carried out by special pathological clerks under the supervision of the Surgical Registrar. At the present time this work is carried on in the Scientific Workroom, and by the use of rapid methods of hardening the time elapsing between removal of a tumour and its microscopic diagnosis has been much shortened: the clerks, some three or four in number, are trained in paraffin-cutting, and most of the sections are thus prepared. There is constant

communication between this department and the pathological laboratory: the work would more naturally be carried out in the latter place did space allow.

If one may judge from the frequency with which material from the Martha Theatre is referred to the Pathological Laboratory for report, the gynæcologists find the department of considerable utility. This branch of histological work is by no means easy. Curettings form the staple material submitted, together with small pieces cut out from the cervix uteri or elsewhere. Everything has to be cut in paraffin, after rapid hardening; the tissue sent up is sometimes so fragmentary that it has to be collected on a filter, tied up in a cigarette paper, and so passed through the various hardening solutions to the final embedding in paraffin: very good sections may thus be obtained. The diagnosis of malignancy or innocency, which is usually the point at issue, can in most cases be made, but unfortunately not always with absolute certainty. That the reports obtained are of utility in the confirmation of diagnosis is shown by the increasing frequency with which they are requested.

Under the heading of "Miscellanea" may be classed a curious selection of objects of interest which find their way to the pathologist. When a patient vomits, expectorates, or voids from the bowel any unfamiliar substance, it is usually sent up to the laboratory for investigation, and many pretty problems may thus arise demanding a somewhat minute acquaintance with animal and vegetable morphology. Among other instances may be mentioned decomposed cabbage-stalk from the trachea, apple-peel from a fæcal fistula, and a pair of the non-parasitic nematode "*Gordius aquaticus*"—alleged by a malingerer to have been expelled from the bladder.

Allusion may here be made to an arrangement with the St. Bartholomew's Journal, by which subscribers to that periodical may send up samples of sputum, urine, &c., for report at a nominal fee, on the lines of the Clinical Research Association. This is understood to be for the benefit of old St. Bartholomew's men in general practice, especially those in the country, in cases where the patient cannot afford an ordinary fee.

In conclusion, a statement of the different lectures and classes now held in connection with the Pathological Department must be added.

In the summer session the lecturer delivers two lectures a week, devoting himself chiefly to general pathology. In the winter session a class in microscopic pathology is held once each week in the Physiological Class-room. This class is attended by nearly a hundred students, and as sections of four

or five morbid tissues are given out at each class, it will be apparent that the preparation for it is no light task. Classes in bacteriology are held three times in the year. Each course consists of an elementary class extending over five or six weeks, to which is added an advanced course for those preparing for Public Health examinations, which lasts a further month or more. These classes are usually attended by from six to twelve students—mostly already qualified men. Apart from the regular courses, facilities are given, so far as space can be found, to those wishing to study bacteriology for shorter periods or for special purposes. Twice a year a class is held in advanced pathological histology and surgical bacteriology for those preparing for the final Fellowship of the College of Surgeons, some four or five demonstrations being given. A similar class is held twice a year for candidates offering themselves for the M.B. or M.D. examinations at the different Universities. Instruction is given to students wishing to act as pathological clerks, and, as they become competent, the services of these gentlemen are of great utility in the routine work of the department. Finally, as much assistance as possible is given to students and others who come up in search of information or the pursuit of knowledge: and they come up at intervals all day.

The writer trusts that this short sketch of the growth and work of the Pathological Department, written at the suggestion of one of the Editors of these Reports, may prove of some interest, and even of some use, as a record of its present scope and aims. He has felt at liberty to write freely of it, perhaps even to praise it, for the very reason that he has been connected with it for too short a period to be able to claim any share in its development. Its work is still growing, and appears likely to grow, but so much encouragement is received both from the Medical and Surgical Staff and the Governors of the Hospital, that there is no reason to doubt that it will be able to meet the demands made upon it.

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NOTES ON THE SERUM REACTION IN TYPHOID FEVER.

BY

J. H. CHURCHILL.

INTRODUCTORY.

While a scientific observation is still new, any collection of cases made with a view of determining its accuracy has a definite value. It is in the hope of confirming to some extent the value of Widal's serum reaction in typhoid fever that these notes are published. They are gathered from more than 120 cases in which the reaction was tried in the Hospital wards by the Pathological Department during the year ending August 1898. All statements made in the notes refer to these cases only. In extracting facts from the clinical notes, every care has been taken to ensure accuracy.

From a summary of statistics from various sources given in "Gould's Year-Book of Medicine and Surgery, 1898," and embracing between three and four thousand cases, it appears that a positive reaction was obtained in 95.5 per cent. of typhoid cases, and a negative result in 98.4 per cent. of non-typhoid cases, *i.e.* that correct results were obtained in 96.5 per cent. of the total. No attempt was made to eliminate erroneous results from among these cases.

I am much indebted to Dr. Andrewes, not only for his suggestion that I should collect these cases, but also for his advice and kind assistance in the preparation of my notes for publication.

METHOD OF OBTAINING THE REACTION.

The method adopted in the Pathological Laboratory has almost invariably been the following:—*In the ward*, the patient's ear or finger is pricked, and into the resulting drop of blood is introduced the end of a capillary pipette; enough blood for the

purpose of the reaction runs into the pipette, the ends of which are then sealed. *In the laboratory*, the ends of the pipette are broken off, the blood is expelled into small glass tubes, and to it are added nine times its volume of sterile broth (each volume being measured by allowing the broth to enter the pipette to the level formerly reached by the blood). The blood is thus diluted 1 in 10. The tube is plugged with cotton-wool, labelled, and allowed to sediment.

A broth tube is inoculated from the stock culture of typhoid bacilli and incubated for twelve to twenty-four hours.

A clean cover-slip is then taken, and on it are placed side by side five or six drops of the diluted blood, measured by a platinum wire loop; with the same loop, to roughly ensure the drops being of the same size, the same number of drops of the fresh typhoid culture are placed on the cover-slip and then mixed with the blood, which is thus diluted 1 in 20. The cover-slip is inverted on a slide, and ringed round with wax. The mixture is examined immediately under a microscope (a $\frac{1}{6}$ objective is quite sufficient), and again at intervals for four hours from the start. If, at the end of this time, no sign of reaction has occurred, a negative report is made.

No special precautions are needed for keeping the blood sterile, since the time of observation is too short to allow much interference with the reaction by the growth of other organisms: the patient's finger need not be sterilised; but if the blood is to be kept, especially in warm weather, until the typhoid culture is ready, it is well to sterilise the glass receptacles used by passing them through the flame, taking care to cool them before use, since the "clumping" power of blood is destroyed at 75° to 80° C.

THE CULTURES OF TYPHOID BACILLI USED.

Some observers have obtained reactions with emulsions of dead bacilli. The only two occasions on which the reaction was tried by us using dead bacilli (killed, after sixteen hours' incubation, (1) by chloroform, and (2) by heating to 59° C. for half an hour) resulted in negative reactions, though the sera used were found to give a good reaction with living bacilli from the same cultures.

If living bacilli are used, it is necessary to see that their vigour, as evidenced by active motion, is unimpaired. To ensure this, it has been the custom in this laboratory to make cultivations from the spleen and mesenteric glands of any typical case of typhoid fever which is examined in the post-mortem room, and

to pass the purified cultures through all the chief tests for typhoid bacilli, viz. :—

1. The absence of gas-formation in gelatin-shake cultures.
2. The absence of indol from broth cultures after prolonged incubation.
3. The absence of coagulation in milk tubes.
4. The microscopical appearance of the bacilli, especially the number of their flagella.
5. The clumping of fresh cultures by the serum of a typhoid fever patient, which has previously been found to cause a typical reaction with a known culture of typhoid bacilli.

A pure culture of good typhoid bacilli being thus obtained, several gelatin tubes are inoculated from it, incubated, and then kept as stock at the room temperature. From one of these a fresh broth-tube is inoculated every time that the serum test is to be performed, so that the actual culture used for the reaction is only two generations from the original culture, though the latter may be some months old; for it is found that repeated subculture from tube to tube eventually lessens the vigour of the bacilli, and modifies their power of clumping.

After several months, however, the stock itself is found to weaken, so that subcultures show less motility than those made from it in the earlier part of its existence. The stock is then changed for a more recent one.

In one case Dr. Andrewes obtained from the spleen of a four months foetus, which had been expelled from the uterus of a woman suffering from typhoid fever in the King's Lynn epidemic (1897), a few colonies of vigorous typhoid bacilli. These were used successfully in the Widal tests for a considerable time.

DILUTION OF THE BLOOD.

The degree of dilution of the blood conventionally used in this laboratory is 1 in 20. It has been found that the blood of certain people who have not suffered from typhoid fever gives a well-marked reaction to this serum test if the degree of dilution is low, but that—in the experience of most observers—such blood fails to give any sign of reaction when diluted to 1 in 10 or more.

DESCRIPTION OF THE REACTION.

When the fresh culture is first mixed with the blood, the bacilli are seen swimming actively to and fro in even distribution through the field. The first sign of reaction is the cluster-

ing together of a few bacilli which lose their progressive motion, but remain actively struggling; to these others are added, and the cluster becomes larger and more compact, only the outer ones seeming to have room to move. Meanwhile, and sometimes quite early in the reaction, the unattached bacilli gradually lose their activity, move sluggishly across the field, or become quite motionless. Three or four clusters or "clumps" may often be seen in a single field.

Between a complete reaction, where nearly all the bacilli are in clumps and none of the free ones are motile, and a reaction where only a few loose but definite clumps are found, the remaining bacilli being free and sluggishly motile, all grades occur.

The essential of the reaction is the formation of clumps; loss of motility is a phenomenon of secondary importance, occurring sometimes under conditions other than enteric fever.

It has on some occasions been noticed in this laboratory that the clumping begins in the neighbourhood of any air-bubbles present under the cover-slip. This is probably due to the tendency of the bacilli to congregate in the neighbourhood of an oxygen supply.

In nearly every case tested, whether the result was positive or not, the slides were kept at 37° C., and re-examined on the following day; but in no case, with some exceptions to be presently noticed, was there any alteration seen in the conditions of the bacilli, save that their motility had materially lessened, and in many cases ceased.

TIME LIMIT OF THE REACTION.

Out of 71 positive cases, 22 have been well-marked or complete within three or four minutes; 17 others have become well-marked within one hour, and 27 within four hours—nearly all before the second hour. The particulars of the remaining five cases, which showed no sign until after the fourth hour, are as follows:—

Case 1.—Blood tested on the fourteenth day showed no sign of reaction in the first four hours, but clumping began during the fifth hour, and became so marked later on, that, contrary to custom, a positive report was made. The diagnosis of typhoid fever was confirmed by post-mortem examination.

Cases 2 and 3.—Slight clumping was first observed between the fifth and seventh hours; at a later date the test was repeated and showed marked clumping within one and two hours. Both recovered and were clinically considered undoubted cases of typhoid fever. (*Case 3* had a son in the Hospital with typhoid fever at the same time—*Case 11*.)

Case 4.—Distinct clumps were found on re-examining the slide on the following day ; a week later the blood was again tested with a markedly positive result. The fever ran a mild course, but was regarded clinically as typhoid.

Case 5.—On first testing the blood no clumps were seen till the following day ; four days later a positive reaction occurred in three hours, and ten days later, during a typical relapse, the reaction was well marked within one hour.

Although Case 5 indicates that the clumping power may develop slowly, yet it is by no means the rule. In one case of typical typhoid fever (Case 9) the test was absolutely negative after twenty hours on the fifth day of the disease, but on the seventh was well marked within two or three minutes (see also Case 7).

DATE OF APPEARANCE OF THE REACTION.

Though, as a rule, the best-marked reactions are obtained in well-marked cases of typhoid fever, yet many such cases occur where the reaction is not so early nor so marked a phenomenon as it is in milder or less typical cases ; and we have been unable to demonstrate any relation between the acuteness of the disease or the prominence of any particular symptom, and either the quality of the reaction or the date of its appearance, which may at all compare with the relation established between the intensity of the infection in pneumonia or the resisting power of the patient, and either the amount or the date of appearance of the leucocytosis. It seems rational to suppose that some such relation exists, but the evidence obtained during the year is wholly insufficient for the discussion of such a theory ; this is partly owing to the lack of early cases of the fever, and partly to the difficulty of establishing the "first day" of the disease.

For the same reasons we have had little opportunity of averaging the dates of appearance of the reaction ; but of 40 cases in which the date of the first day of the disease could be reasonably approximated, it was found that the average date of appearance of the reaction was the thirteenth day. We were only able, however, to test ten of these cases before the reaction was apparent, the result being as follows :—

Cases. ¹	Negative after 24 Hours.	Negative after 4 Hours, but some Clumping between 4 and 24 Hours.	Positive within 4 Hours.
2*	11th day	15th day	33rd day
3*	...	15th day	21st day
4*	...	11th day	19th day
5*	...	35th day	40th and 50th days
6	14th day	...	25th and 35th days
7	5th and 11th days	...	13th day
8	15th and 18th days	...	24th day
9	5th day	...	7th day
10	3rd day	...	12th day
11	9th day	...	18th day

It is evident that seven of these are cases in which the reaction developed unusually late; in Case 2 it developed during a recrudescence of the fever, the temperature having fallen to normal for a few hours on the ninth day of the disease; in Case 5 the patient was admitted after five weeks' illness, with swelling of the left leg and thigh, and underwent a typical relapse. If, therefore, we could test all our cases much earlier in the disease, we should certainly obtain a much larger number whose reaction developed about the end of the first week or beginning of the second, and the average date we have mentioned, viz., thirteenth day, would give place to an earlier one. Nine of our 40 cases gave a positive reaction between the fifth and eighth days; only one as early as the fifth day.

Besides these peculiarities in the time of appearance of the reaction, there is another phenomenon which we have twice seen. It is agreed by most observers that the clumping power is usually retained by the blood long after the patient has left the Hospital; we have ourselves observed it eighteen months after the cessation of the fever. In two cases, however, the reaction has failed on a repetition of the test at a later date:—

Case 6.*—A well-marked case of typhoid fever, with a relapse and phlebitis in the left thigh. On re-testing the blood after the thirty-fifth day no sign of reaction was obtained.

Case 12.—A child of thirteen months, whose blood on one occasion gave a well-marked reaction within one hour, but six days later gave none. Although as enteric fever the case presented some elements of doubt, yet there was nothing objective found to account for the fever in any other way, and clinically the diagnosis of enteric fever was made.

¹ Cases marked with an asterisk have been mentioned above.

As an instance of the more usual phenomenon of retention by the blood of its clumping power for some months we quote the following:—

Case 13.—The blood reacted definitely but not well in an hour and a half. The patient died of septicæmia, and no typhoid lesions were discovered post-mortem. An inquiry into her history elicited the fact that she had suffered from typhoid fever three or four months before her admission to the Hospital.

Only once during the year under consideration did we find a case of undoubted typhoid fever which gave no reaction:—

Case 14.—On the day of admission the blood gave no sign of reaction after four hours; three times during the next twenty-one days the blood was re-tested and watched for two or three hours, with no observed reaction. The patient recovered.

This case should be compared with Case 5, where no definite reaction was found until after the thirty-fifth day.

THE SERUM TEST IN NON-TYPHOID CASES.

We have tested, in the course of the clinical work, more than 50 cases of diseases other than typhoid fever, and in no case has a positive reaction occurred. Among these are: appendicitis, perimetritis, rheumatic fever with endocarditis, pericarditis, infective endocarditis, influenza, pneumonia, meningitis, otitis media, pleurisy with effusion, malaria, scarlet fever, phthisis with marked pyrexia, constipation, diarrhœa, hæmaturia, headache, and “febricula.”

Case 15.—One case I mention in particular, in which re-examination of the slide on the day after the test was begun revealed the presence of a few clumps, none having been seen during the first four hours: a negative report was made and the test repeated two days later, when no sign of clumping made its appearance even after twenty-four hours. The negative report was thus confirmed, and at the post-mortem examination a day or two later no indication of typhoid fever was found, the conditions being —“otitis media, splenic and renal infarcts, recent endocarditis.”

THE SERUM TEST COMBINED WITH BLOOD-COUNTS.

If a blood-count had been made in Case 15, a leucocytosis would almost certainly have been found, lending additional weight to the evidence of the serum test against a diagnosis of typhoid fever. This leads us to consider 6 cases in which a blood-count was made in addition to the test.

Case 5.*—On the forty-first day, a day after the positive reaction was first obtained, a blood-count revealed only 3000 leucocytes per c.m.m., the patient's temperature being 102° F.

Case 16.—This patient was convalescent from a typical attack of rheumatic fever, and had been up and about the ward for some days. A fresh rise of temperature occurred, and all the usual signs of typhoid fever made their appearance. On the twelfth day a blood-count revealed no leucocytosis, and a positive reaction was returned to the serum test. Three days later a repetition of the test again gave a positive result. The patient soon died of perforation, and typical typhoid lesions were discovered post-mortem. There was no evidence of any healing ulcer of earlier date.

The absence of leucocytosis in this case at once negated the idea that the second rise of temperature could be due to rheumatism.

Case 17.—Admitted with headache, pyrexia, and furred tongue. The serum test gave a negative result: five days later a leucocytosis of 16,500 was found; on the same day the patient expectorated copiously and his temperature fell. In the sputum were found many large clusters of bacilli, which on cultivation proved to be Pfeiffer's influenza bacilli.

Case 18.—Admitted for shivering, headache, and pyrexia. On the second day the serum test was negative, and a leucocytosis of 14,000 was found: on the third day the temperature fell to normal and remained there. The case was diagnosed as influenza.

Case 19.—Admitted with a history of ague. The serum test was negative and there was no increase of leucocytes. A careful examination of the blood revealed the presence of the plasmodia of malarial fever.

Case 20.—A child of ten years, admitted for headache, abdominal pain, and diarrhoea on the sixteenth day of the disease. The serum test on the twenty-third day was negative; it was repeated on the twenty-fourth day with the same result. The blood was counted and showed 25,000 leucocytes per c.m.m.—a very marked leucocytosis. The child died, and the post-mortem examination revealed "appendiceal abscess; suppurative pylephlebitis, multiple abscess of the liver, septic infarcts."

These cases are striking examples of the importance of counting the leucocytes in the blood of patients who are under the suspicion of having typhoid fever, and whose blood has not reacted to the serum test. In this connection it is important to know that the chief febrile diseases in which a leucocytosis is not found are:—typhoid fever, malaria, measles, r  theln, grippe (three-quarters of the cases recorded), tuberculosis. The invariability of this rule in tuberculosis has not yet been proved; and at all events, not only in this, but in the other five diseases the absence of leucocytosis is only co-existent with the absence of complications such as pyogenic infection, pneumonia, and the like. It was fortunate that in both the cases of influenza cited a leucocytosis should have been obtained.

SUMMARY.

Method.—It is advisable that the culture of typhoid bacilli be vigorous and of not more than twenty-four hours' growth. The patient's blood must be diluted at least 1 in 10: precautions for keeping the blood sterile need not be very strict.

The Reaction.—Using a dilution of 1 in 20, the reaction occurs in the vast majority of cases within two hours of the start. A positive report is quite safe if clumping occurs within four hours; after that time it is not safe, but the test should be repeated in a day or two.

Date of the Reaction.—The average date of appearance of the reaction is the thirteenth day of the disease, or earlier. It has not appeared in this series of cases before the fifth day. The reaction may not develop until quite late in the disease. It is exceedingly rare for the blood to lose its clumping power before the patient leaves Hospital.

There is no definite relation yet established between the severity of the disease and the character of the reaction or the date of its appearance.

Accuracy of the Test.—Out of 71 cases of typhoid fever tested, 70 reacted positively at some period of their course (Case 14).

Out of more than 50 cases which were not typhoid fever, only one gave a positive reaction (Case 13), and that had suffered from typhoid fever three or four months before.

Combination with Blood-Counts.—It is of the utmost importance, for the sake of diagnosis in a case of doubt, to count the leucocytes in the patient's blood.

ALCOHOLIC CIRRHOSIS.¹

BY

R. A. YELD, M.A., M.B., B.C.

INTRODUCTION.

In the following paper the statistical results of an examination of 131 cases of alcoholic cirrhosis will be dealt with. These results are taken from the post-mortem notes of this Hospital from 1886 to 1897 inclusive, and from the corresponding ward notes. During this period of twelve years there were 4117 post-mortem examinations and 164 cases of cirrhosis of the liver: 33 cases are therefore excluded from this paper, of which 7 were examples of cirrhosis in children, 16 of (possibly) non-alcoholic cirrhosis in adults, and 10 of alcoholic cirrhosis in which the kidneys were set down as “?granular.” Out of the 131 cases selected as alcoholic there was direct confession of alcohol in 60 only, but none of the remaining cases gave rise to any doubt as to their origin.

In some the disease was overlooked during life; in other cases the patients were brought in dead, so that no history was obtained; in others alcoholism was obvious from the appearance; and for the rest, the notorious habit of lying among sufferers from this disease sufficiently accounts for the absence of direct evidence of alcoholism.

One of the chief objects of the paper is to show that granular kidney is more frequent in cirrhosis of the liver than is generally admitted.

An endeavour has also been made to determine how far the existence of granular kidney may modify the features of the case in hepatic cirrhosis by a comparison of 44 cases of cirrhosis in which the kidneys were sound with 44 cases in which they were granular.

¹ An abstract from a thesis for the M.B. Cantab. on “Cirrhosis of the Li and its Relation to Granular Kidney.”

In each of the 131 cases of cirrhosis the following data were obtained from the ward notes and post-mortem register:—

- (1.) Age and sex.
- (2.) Liver—(a) Weight and size; (β) appearance; (γ) miscellaneous.
- (3.) State of the capsule of the liver.
- (4.) State of kidneys.
- (5.) State of the spleen—(a) Weight and size; (β) consistency.
- (6.) State of the capsule of the spleen.
- (7.) State of the peritoneum and presence of fluid.
- (8.) State of the joints with regard to the presence of biurate of sodium.
- (9.) History as regards kind of alcohol imbibed.
- (10.) Symptoms—(a) Jaundice; (β) ascites; (γ) melæna;
- (δ) "cholæmia;" (ϵ) hæmatemesis; (ζ) albuminuria.
- (11.) Cause of death.
- (12.) Latency of the cirrhosis.
- (13.) Frequency of tubercle in any organ.

In the course of my investigations certain difficulties were met with which detract from the results.

(1.) The weight of the liver and spleen was sometimes omitted in the post-mortem books.

(2.) The joints were seldom examined.

(3.) The kind of alcohol was frequently not specified in the ward notes.

(4.) The cause of death was difficult to determine, and I would suggest in all humility that a special heading should be set apart in the books for this important item.

(5.) State of the capsule. In cases of perihepatitis and perisplenitis, Hale White¹ has pointed out the importance of the distinction between a partial and universal thickening of the capsule. This distinction was seldom noted in the post-mortem books.

(6.) In many cases, and for various reasons, there were no ward notes.

As the full tables of these cases are somewhat bulky they cannot be included here.

The paper will be divided into two parts:—

(A.) The statistical results obtained from analysis of all the 131 cases of alcoholic cirrhosis considered together.

(B.) The statistical results obtained from a comparison of 44 cases of alcoholic cirrhosis with granular kidney, with 44 cases in which the kidneys were normal.

I am indebted to Dr. Church, Dr. Gee, Sir Dyce Duckworth,

¹ Hale White, *Clinical Society's Transactions*, vol. xxi.

Dr. Hensley, and Dr. Lauder Brunton for kind permission to make use of their ward notes. I am also indebted to Dr. Morley Fletcher for valuable suggestions and advice.

(A.) ALL THE CASES CONSIDERED TOGETHER.

Sex.—Females, 29; males, 102 (78 per cent.). This result agrees with that obtained by Price, who collected 142 cases from Guy's Hospital register from 1875–1883 inclusive.¹ Kelynack, however, in a recent examination of 121 cases, found the proportion of men to women to be 2 to 1 instead of 3 to 1.²

Age.—The age was unknown in 3 cases, but for the remaining 128 it was 47.5 at death. The maximum age was 72. The minimum age was 20.

The Liver.—(a.) As no microscopical examinations were made, the type of liver had to be decided on naked-eye evidence alone. With regard to fatty cirrhosis, Foxwell has pointed out that it is impossible to be certain that a cirrhotic liver is fatty without using the microscope.³ It is therefore evident that the results of examination of such livers must be accepted with reserve.

In the following table the livers are arranged in three groups:—(1.) Hobnailed; (2.) "fatty;" (3.) irregular (under this heading are included all livers not definitely described as fatty or hobnailed).

(β.) The size of the liver was deduced partly from ward notes, partly from the weight found at the post-mortem. In estimating the size from the weight, a large margin was allowed for the normal (40–65 oz.). In 12 cases it was impossible to come to any decision as regards size.

(γ.) Among miscellaneous points connected with the liver was the important one of portal thrombosis. This is mentioned only three times in the post-mortem notes. Probably, however, the portal vein is seldom examined.

Hawkins⁴ says that it is a rare complication. According to Osler, thrombosis of the portal vein is frequent in cirrhosis.⁵ A full description of these cases will be found in an appendix to this paper.

¹ See "143 Cases of Cirrhosis of the Liver," Guy's Hospital Reports, 1884.

² See Brit. Med. Journ., Epit., 368, May 15, 1897.

³ Foxwell, Brit. Med. Journ., Feb. 15, 1896, p. 393.

⁴ Hawkins, article on Cirrhosis of Liver in Professor Allbutt's System of Medicine, vol. iv. p. 173–188.

⁵ Osler, Principles and Practice of Medicine, 2nd edit., 1895, p. 464.

THE LIVER.

Types.	Number.	Average Weight.	Maximum Weight.	Minimum Weight.	Not Weighed.	Small.	Normal.	Enlarged.	Doubtful Size.	Surface.	Miscellaneous.
"Fatty"	25	oz. 76	oz. 126	oz. 48	1	None	2	22	1	Of eight livers definitely described as <i>smooth</i> , six were "fatty."	(i.) Four livers showed some "nutmeg" change. (ii.) Gall-stones present in ten cases. (iii.) Portal thrombosis in three.
Hobnailed	45	59	93	30	10	14	7	19	5		
Irregular	61	63	124	20	16	12	20	23	6		
Total	131	66	126	20	27	26	29	64	12	...	...

From this table the following conclusions are drawn:—

(1.) That the "fatty" liver (as diagnosed by the naked eye) is usually both heavier and larger than the non-fatty. This is in accordance with the old view, and opposed to that of Foxwell, who maintains that the size of the fatty cirrhotic liver is quite variable, and that its weight is not greater than that of the non-fatty liver.¹

(2.) That a smooth cirrhotic liver is not necessarily fatty.

(3.) That the alcoholic cirrhotic liver, irrespective of type, is both larger and heavier than the normal liver in the majority of cases. We may, therefore, generally expect to feel such a liver during life.

(4.) That the average weight of the hobnailed liver is the lowest of the three types (viz., "fatty," "irregular," and "hobnailed"), but that the smallest liver is not necessarily hobnailed.

(5.) That the hobnailed liver is not so common as might be expected (about 21 per cent. only). This is in accordance with Kelynack's results.²

The Capsule of the Liver.—Perihepatitis probably local in 23 cases (17 per cent.). Perihepatitis probably universal in 8 cases (6 per cent.). Total 23 per cent.

The distinction between universal and partial perihepatitis was rarely made, but from the few certain cases of universal perihepatitis I conclude that it may co-exist with cirrhosis of extreme degree. This is opposed to Hale White's views.³

¹ Foxwell, Brit. Med. Journ., Feb. 15, 1896, p. 393.

² Kelynack, Brit. Med. Journ., Epit., May 15, 1897.

³ Hale White, Clin. Soc. Trans., vol. xxi.

The Kidneys.—(a.) In 44 out of the 131 cases granular kidneys are recorded. This is practically 33.5 per cent. This percentage is very high, but, considering the lives these patients lead, is not to be wondered at, for granular kidney is known to be very frequently associated with alcoholism. Hawkins,¹ in Allbutt's System of Medicine, puts the frequency at 15 per cent. Kelynack,² in his examination of 121 cases, makes it 18.5 per cent.

Professor Clifford Allbutt has reminded me that pathologists differ widely in their views as to what is and what is not a granular kidney, and has suggested that many of the cases set down as "granular" in the St. Bartholomew Hospital Post-mortem Register may have been examples of "replacement-fibrosis," or, in other words, simply senile kidneys.³

The average age of the patients with cirrhosis of liver and kidney was, however, only 52.7, so that if many of these kidneys were examples of "replacement-fibrosis," then many of the patients must have been prematurely old. It might be urged that a kidney which is physiological at ninety is pathological at fifty, but, granting this, such a kidney is not necessarily granular in the sense in which the term is usually accepted.

In this paper the simple macroscopic description of the pathologist has been accepted from necessity, as no microscopical examination was made in any case.

(β.) In 18 other cases the kidneys were abnormal (13.8 per cent.). The following is a list of the abnormalities:—

- (1.) Five cases of cardiac kidney.
- (2.) Four cases in which calculi were present.
- (3.) Two cases of "large white" kidneys.
- (4.) One case of tubercular cyst.
- (5.) One case of secondary malignant deposits.
- (6.) One case of secondary involvement by malignant growth.
- (7.) One case in which the left kidney was atrophied and the right hypertrophied.
- (8.) One case of advanced tubercular disease.
- (9.) One case of "small white" kidneys.
- (10.) One case of fatty kidneys.

¹ Hawkins, Allbutt's System of Medicine, vol. iv. pp. 173-188, on Cirrhosis of Liver.

² Kelynack, Brit. Med. Journ., Epit., 368, May 15, 1897.

³ The term "replacement-fibrosis" is used for those cases in which there is no real increase of the interstitial fibrous tissue in the kidney, but only a replacement by fibrous tissue of degenerate glandular elements.

THE SPLEEN.

Size.	Weight.	Consistency.
Enlarged . . 85	Max. . . 46 oz.	Soft . . . , 36
Normal . . . 33	Min. . . 2½ oz.	Hard 23
Small 7	Av. . . . 13.3 oz.	Unknown . . 72
Unknown . . . 6		

Where the size of the spleen was not expressly stated it was assumed that a spleen weighing 10 oz. or more was enlarged; that when it weighed between 10 oz. and 4 oz. it was normal; and that when it weighed less than 4 oz. it was small.

As regards weight it is much to be regretted that 43 spleens were not weighed.

From the above table the following conclusion is drawn:—

The spleen is enlarged in 68 per cent. of cases; Frerichs puts it at 50 per cent. in his book on diseases of the liver.¹ Kelynack makes it 83 per cent.²

With regard to consistency and weight, the deficiencies in the post-mortem books have made it impossible to come to any conclusion.

Capsule of the Spleen.—Perisplenitis in 43 cases = 33 per cent. The extent to which the capsule was affected was not mentioned in the books. It appears to be present more frequently than perihepatitis, a fact of some importance.

Peritoneum.—(i.) Fluid present post-mortem without any signs of peritonitis in 32.8 per cent.

(ii.) Chronic simple peritonitis in 10.7 per cent. In 4.5 per cent. this appeared to be due to the cirrhosis.

Joints.—Not examined in 88 cases; normal in 34; biurate of sodium present in 9 (21 per cent.). Owing to the small number of cases examined (43 in all) the percentage cannot be considered as more than probable.

History.—In 12 cases there was a history of syphilis = 9 per cent. In none of these was there any suspicion of syphilitic cirrhosis.

In 60 cases only there was confession of excessive drinking, and in 19 of these the kind of drink was not specified.

¹ "Diseases of the Liver," New Sydenham Society's Translation.

² See Brit. Med. Journ., Epit., May 15, 1897.

Kind of Drink.	Number.	Weight of Liver.	Livers not Weighed.	Type.
Beer-drinkers . . .	11	Av. 73.2 oz.	2	4 fatty.
Spirit-drinkers . . .	19	Av. 61.0 oz.	3	2 fatty.
Beer and spirit-drinkers	11	Av. 60.7 oz.	2	1 fatty.

From this table the following conclusions are drawn:—

(1.) That spirit-drinkers are in the majority among patients with cirrhotic livers.

(2.) That the percentage of “fatty” livers among the three types (fatty, irregular, and hobnailed) is highest for the beer-drinker (36 per cent.), lowest for the mixed drinker (9 per cent.), and intermediate for the spirit-drinker.

(3.) That those who drank beer and spirits had less fatty livers and less average weight of liver than either the beer or spirit drinkers, whereas one would expect them to show results intermediate between these. It is impossible, however, to form a judgment on the achievements of confused drinkers.

With regard to the last conclusion, the small number of cases in which the kind of drink was specified may give rise to fallacy. It must be remembered also that none of the “fatty” livers were proved to be so microscopically.

Symptoms.—(i.) In 46 cases none recorded.

(ii.) Ascites in 74 cases.

(iii.) Jaundice in 42: (*a.*) deep, 7; (*β.*) moderate, 17; (*γ.*) very slight, 18.

(iv.) Hæmatemesis in 26; excessive in 5.

(v.) Cholæmia (or head-symptoms when kidneys were sound) in 17.

(vi.) Melæna in 7.

(vii.) In 11 cases ascites and hæmatemesis occurred together. In 3 of these the hæmatemesis was excessive: in one of the 11 cases in which these two symptoms occurred the patient had œsophageal varices.

(viii.) There was no suspicion of biliary cirrhosis in the 7 cases of deep jaundice, nor could the icterus be accounted for by anything but the cirrhosis of the liver.

(ix.) Pyrexia was unfortunately not recorded in my notes.

(x.) Albuminuria was frequently present without renal disease obvious to the naked eye.

Cause of Death.—In 4 cases was unknown; in the remaining 127 cases death was due—

(A.) In 39 cases to *cirrhosis* = 30.7 per cent.¹ In 5 of these death was directly due to excessive hæmatemesis.

(B.) In 17 cases to *cirrhosis complicated* by some other morbid state = 13.3 per cent.

(C.) In 71 cases to *causes other than cirrhosis* = 55.8 per cent.

(a) Pulmonary; (β) cardio-vascular or circulatory; (γ) renal, *i.e.* obviously renal; (δ) new growth; (ε) miscellaneous.

A complete table of groups B and C here follows. In the two cases in which diabetes was present, no pigmentation of the skin was observed. In one of the cases the sugar disappeared from the urine in the last four days before death, and in the other no sugar was found at any time during the last illness, but there was a very clear history of diabetes. (See appendix.)

Tubercle was found very frequently, and will be discussed later. It appears to have been of importance in causing death only in the cases tabulated.

Phthisis, pneumonia, granular kidneys, and new growth, seemed to be the most important causes of death in group C.

GROUP B.

Cirrhosis complicated by—

	Cases.
1. Granular kidneys	7
2. Pleural effusion	2
3. Bronchitis	2
4. Phthisis	1
5. Bronchitis with fatty heart	1
6. Aortic regurgitation	1
7. "Morbus cordis"	1
8. Diabetes	2
Total	17

N.B.—Though some of these conditions occurred in other cases, it was only in 17 that they seemed to have been of importance in causing death.

¹ Kelynack says 50 per cent.

GROUP C.—*Causes other than Cirrhosis.*

(a) Pulmonary 17.	(β) Circulatory 26.	(γ) Renal 6.	(δ) New Growth 10.	(ε) Miscellaneous 12.
Cases	Cases	Cases	Cases	Cases
Pneumonia } 9	"Morbus cordis" } 4	Uræmia . . 6	Tumor cerebri } 1	Ulcerative endocarditis } 3
Phthisis } 6	"Cardiac failure" } 3	Due to granular kidneys in 5, and to chronic parenchymatous nephritis in 1.	Tumor cerebelli } 1	Erysipelas . } 1
Phthisis and M. cordis } 1	Fatty heart } 2		Cancer pancreas } 2	Puerperal septicæmia and septic pneumonia } 1
Phthisis and hæmorrhagic pleural effusion } 1	Coronary stenosis } 2		Cancer œsoph. } 1	Tubercle of genito-urinary tract } 1
	Aortic disease } 2		Hepatic cancer } 1	Alcoholism and degeneration in spinal cord } 1
	Cardiac degeneration } 1	Total . 6 or 4.5 per cent.	Mediastinal and abdominal new growth } 1	"Chronic convex sc. meningitis" } 1
Total 17 or 13.3 per cent.	Total . 14 or 11 per cent.	<i>N.B.</i> — Many of the deaths mentioned under heading of "circulatory" were probably due to renal disease. This point will be discussed later in the paper.	New growth of bile ducts } 1	H ₂ SO ₄ and HNO ₃ poisoning } 1
	Rupt. aort. aneurism } 2		New growth and abscess in left lung } 1	Bronchitis and bronchiectasis } 1
	"Cerebral" hæmorrhage } 6		New growth in lung, and pleura and aortic disease, and gastric ulcer } 1	Thrombosis of sup. vena cava } 1
	Pontine hæmorrhage } 3			Edema of larynx from syph. ulc. of thyr. cart. } 1
	Meningeal hæmorrhage } 1			
	Cerebellar hæmorrhage } 1			Total . 12
	Total . 12 or 9 per cent.		Total . 10 or 7.8 per cent.	

Latency of Cirrhosis of the Liver.—Of the 131 cases there were 5 in which this question could not be decided. Of the remaining 126 cases there were 59 latent and 67 declared.

LATENT.

Number.—59=46.8 per cent.

Sex.—Latent in 48 males.

Latent in 11 females.

Age.—Known in 56 cases only.

Average for 56=48.9 years.

DECLARED.

Number.—67=53.2 per cent.

Sex.—Declared in 49 males.

Declared in 18 females.

Age.—Known in all 67, but to exclude fallacy the average age for 56 cases only was taken, average for 56=46.5 years.

From this I conclude that—

- (1.) Cirrhosis is less often latent than declared.
- (2.) Cirrhosis is more often latent in men than in women.
- (3.) Cirrhosis may remain stationary, since those in whom it was latent lived to a greater age on the average than those in whom the disease was declared during life.

In fact, latency means delay in the progress of the disease. The causes of such delay could not be determined from the data in my possession (see Appendix).

Tubercle was present in 22 per cent. of the 131 cases. This is about the same percentage as that for gout, but the percentage of the latter is founded on insufficient data (see Joints). Kelynack in his series of cases makes it 24 per cent.

Owing to the meagre description in the post-mortem books, the exact type of tubercle present was not always very clear. Hawkins states that miliary tubercle of pleura or peritoneum, or both, is most common in hepatic cirrhosis, but from these cases it would appear that tubercle in the lung was infinitely more common. It was chiefly in the form of scarring, obsolete deposits, old single cavities, &c., *i.e.* chiefly inactive.

In the lung	26 cases
In the peritoneum	2 „
In the genito-urinary tract	1 „

Phthisis seems to have caused death in 8 cases, and to have accelerated death in 1.

Tubercular peritonitis did not cause death in either of the 2 cases.

Genito-urinary tuberculosis was the cause of one death.

Roughly tubercle caused death in 10 out of the 131 cases = 7.8 per cent. This is lower than Kelynack's estimate, *viz.*, 12 per cent.

Indeed, the percentage of cases in which tubercle *caused death* is no greater in this instance than the percentage of deaths from new growth.

Tubercle is, therefore, often present, but kills comparatively seldom.

B.—STATISTICAL RESULTS.

With a view to determine the effect of the presence of granular kidney in cases of cirrhosis of the liver, *i.e.* how far such kidneys can modify the various aspects of the disease, 44 cases of cirrhosis of the liver with healthy kidneys were compared with 44 cases in which the kidneys were granular.

WITH GRANULAR KIDNEY.

Age.—Maximum 72
 Minimum 32
 Average 52.7
 (Age known in 41 cases only.)

Sex.—Males 35
 = 79.5 per cent.
 Females 9

Liver.—Hobnailed 13
 “Fatty” 10 } 44
 Irregular 21 }
 Average weight = 61.5 oz.
 (40 livers were weighed, but in estimating average weight only 25 were taken.)

Joints.—Not examined 24
 Normal 14
 Biurate in 5
 = 25 per cent.
 Doubtful 1

History of gout in 2 of the cases in which joints were not examined.

History.—Syphilis 12
 = 9 per cent.

Kind of alcohol (in 14 who confessed).
 Beer-drinkers 4
 Spirit-drinkers 4
 Beer and spirits 3
 “Hard drinkers” 2

Cause of death.—

1. Cirrhosis 8
 = 20.5 per cent.*
2. Pulmonary disease 5
3. Granular kidneys 18
 = 46 per cent.
4. Granular kidneys and }
 cirrhosis } 4
5. Miscellaneous 3
6. Aortic disease 5
7. Doubtful 1

Latency.—Latent 27
 = 61 per cent.
 Declared 17

Tubercle.—Present in 11
 = 25 per cent.
 (All pulmonary.)

* This percentage taken from 39 cases, since 5 were inadmissible.

WITHOUT GRANULAR KIDNEY.

Age.—Maximum 62
 Minimum 25
 Average 44.6
 (Average age taken from 41 cases only, but age known in all 44.)

Sex.—Males 31
 = 70.4 per cent.
 Females 13

Liver.—Hobnailed 17
 “Fatty” 2 } 44
 Irregular 25 }
 Average weight = 63 oz.
 (Only 25 livers were weighed.)

Joints.—Not examined 31
 Normal 10
 Biurate in 3
 = 23 per cent.
 Doubtful None.

(History of gout in 2 of the cases in which joints were not examined.)

History.—Syphilis 5
 = 11 per cent.

Kind of alcohol (in 22 who confessed).
 Beer-drinkers 3
 Spirit-drinkers 11
 Beer and spirits 3
 “Hard drinkers” 5

Cause of death.—

1. Cirrhosis 20
 = 55.5 per cent.*
2. Pulmonary disease 7
3. Tumor cerebri 1
4. Tumor cerebelli 1
5. Pontine hæmorrhage 1
6. Meningeal and } hæmor-
 cerebellar } rhage. 1
7. Miscellaneous 5
8. Doubtful 2
9. Other conditions and }
 Cirrhosis } 6

Latency.—Latent 14
 = 34 per cent.
 Declared 30

Tubercle.—Present in 9
 = 20.4 per cent.
 (In lungs 7; in peritoneum 2.)

* This percentage taken from 36 cases, since 8 were inadmissible.

WITH GRANULAR KIDNEY.	WITHOUT GRANULAR KIDNEY.
<i>Perihepatitis</i> .— Probably { Universal . . . 1 Partial . . . 8	<i>Perihepatitis</i> .— Probably { Universal . . . 3 Partial . . . 5
<i>Perisplenitis</i> .—14 (One of these was “nodular,” and one recent.) It could not be made out whether the perisplenitis was universal or partial.	<i>Perisplenitis</i> .—17 (One of these was tubercular.) It could not be made out whether the perisplenitis was universal or partial.
<i>Peritonitis</i> .— Marked in 3 Slight in 2 Malignant in 1 Secondary in 1 (to pelvic abscess.)	<i>Peritonitis</i> .— Recent in 2 Chronic tubercular 2 Chronic simple 2 Partial 1

From this table I conclude—

(1.) That when there is granular kidney, the average age of cirrhotic patients at death is higher than when the kidneys are healthy by eight years.

(2.) That the proportion of males to females when the kidneys are granular is as 80 to 20, whereas when kidneys are sound it is as 70 to 30 (roughly), *i.e.* the majority of males with cirrhotic livers over females with cirrhotic livers is greater when the kidneys are granular. This simply comes to mean that granular kidneys are more common in men—a sufficiently well-known fact.

(3.) The liver is more often “fatty” when the kidneys are granular, but yet its average weight is less than when the kidneys are normal. There is probably some fallacy here, because a great many livers were not weighed.

(4.) As regards gout, no conclusions of any value could be drawn, as hardly any of the joints were examined. From the few cases observed there would seem to be rather more gout when the kidneys are granular—as one would expect.

(5.) As regards syphilis no conclusions can be drawn. As regards alcohol, beer-drinkers would seem to be slightly more common among those with granular kidneys than among those with healthy kidneys. This accords with the views of Barr, who holds that beer is more likely to produce granular kidney than spirits.¹

(6.) When there is granular kidney the tendency to die of the hepatic disease is greatly lessened, since 46 per cent. die of their kidneys and 20.5 per cent. of their livers, as against 55.5 per cent. dying of their livers among those with sound kidneys.

¹ Barr, *Brit. Med. Journ.*, *Epit.*, 242, Sept. 25, 1897.

(7.) The hepatic disease is more often latent when the kidneys are granular.

(8.) The proportion of tubercle is slightly greater when the kidneys are granular.

(9.) Since patients with granular kidneys are older at death than those without it, we must assume either that—(a) Cirrhosis remains stationary, owing to great resistance of patient or a lull in his drinking habits; or (β) The patient develops cirrhosis of liver at a greater age than the patients in whom the kidneys are sound.

(10.) No conclusion could be drawn with regard to perihepatitis, perisplenitis, or peritonitis.

In the course of a somewhat unprofitable investigation into some cases of perihepatitis, I came to the conclusion that granular kidney is much more frequent in the latter disease than in cirrhosis of the liver. This is in agreement with the statements of various authors, *e.g.* Fagge and Hale White.¹

APPENDIX.

Cirrhosis of Liver with Diabetes. (Two Cases.)

(A.) Male aged fifty-seven. Liver weighed 65 oz. and was highly cirrhotic. There were stones in the gall-bladder. Capsule of liver normal. The kidneys were cardiac. The spleen weighed 42 oz., and was very large and soft. There were many adhesions of the omentum to the parietal peritoneum. The capsule of the spleen was thickened. The joints were not examined.

There was no history of drink or syphilis, but there was no doubt of the former. The condition of the liver was not diagnosed, and the only points suggesting cirrhosis were hepatic enlargement felt during life and slight jaundice. The man had mitral and aortic incompetence, and died of ulcerative endocarditis. There was a clear history of diabetes, but no sugar was passed at any time during the last illness. There was no pigmentation of the skin.

(B.) Male aged fifty-four. Liver weighed 82 oz., and was very large and hobnailed. There were stones in the gall-bladder, and the cystic duct was blocked by inflammatory thickening. The capsule of the liver was normal. The kidneys were very large; otherwise normal. The spleen weighed 12 oz. The peritoneum was full of fluid. The joints were not examined.

¹ See Fagge's "Text-Book of Medicine," vol. ii. p. 374, and Hale White on Universal Perihepatitis, vol. xxi. Clin. Soc. Trans.

There was no history obtained of drink or syphilis. Slight jaundice and ascites pointed to cirrhosis, which was diagnosed. Tubercle at both lung apices. Pancreas normal and no pigmentation of the skin. Stigmata on face. Dilated stomach and oesophageal varices. Extreme thirst and sugar in urine, which, however, disappeared four days before death. Death appears to have been due partly to diabetes and partly to cirrhosis.

Cirrhosis of Liver with Portal Thrombosis. (Three Cases.)

(A.) Male aged fifty-five. Liver cirrhosis extreme but size normal; not weighed. Capsule of liver normal. Kidneys normal. Spleen small and soft; capsule thickened. Peritoneum full of fluid. Joints not examined.

History.—Denied alcohol and syphilis. Ascites was the only symptom pointing to cirrhosis, but the patient was a wine porter with morning sickness, and the diagnosis was not considered doubtful.

(B.) Male aged forty-nine. Liver shrunken and distorted, but cirrhosis not extreme. Capsule of the liver, pitted perihepatitis, whether partial or universal not stated. Kidneys normal. Spleen large and pulpy. Perisplenitis, whether partial or universal not stated. Peritoneum, chronic peritonitis and about a pint of fluid present. Joints not examined.

History of much beer and some spirit drinking. Ascites, hæmatemesis, and cholæmia pointed to the diagnosis. The patient was tapped over and over again, and probably the thrombosis of the portal vein was due to perihepatitis. Death was probably due to perihepatitis also.

(C.) Male aged sixty-two. Liver 68 oz., hobnailed. Capsule of liver covered with a thick layer of pearly-pitted lymph. Kidneys, small calculus in left. Spleen weighed 7 oz. Perisplenic adhesions. Peritoneum full of fluid. Joints not examined.

History of much beer and whisky. Jaundice, ascites, and cholæmia, with enlarged tender liver having hard irregular edge, pointed to the cirrhotic condition during life. There was also evidence of gout.

PROBABLE CAUSES OF LATENCY IN CIRRHOSIS.

(1.) The patient may take the advice of his physician, and cease to drink either permanently or for a considerable period of time.

(2.) The functions of the liver may be but little interfered with—(a) Because there is an extraordinarily large blood-

supply from the hepatic artery ; (β) Because there is free exit of portal blood into the general circulation by venous anastomosis. If the anastomotic and compensatory circulation is free and well maintained, the disease continues latent.

(3.) It is conceivable that the liver in some cases might after a time become tolerant of the irritant, or exhibit so marked a resistance that other organs, *e.g.* the kidneys, would fail utterly before the liver itself was appreciably affected. In such cases cirrhosis might be perhaps more aptly described as incipient than latent.

(4.) The intercurrent of some other disease might suspend for a time the changes in the liver.

(5.) Also the amount of atrophy which the liver cells may have undergone is of importance. Death may result, or symptoms arise when destruction has passed a certain limit.

ANNALS IN THE LIFE OF A COUNTRY DOCTOR BETWEEN 1852-1898.

BY

H. S. WEBB, WELWYN, HERTS.

Soon after commencing practice, I was sent for to a gunshot accident. A lad ten years old was walking behind another boy who was carrying a gun, which by some means was discharged, the contents lodging in the front part of the right shoulder-joint of his companion. He was taken to his home, a small cottage near, and I saw him about an hour after.

The head of the humerus was fractured in all directions, the soft parts much lacerated, but there had not been a great deal of hæmorrhage. It was dusk in the evening when he recovered from collapse, when, with the kind assistance of Dr. Drage of Hatfield, I amputated the limb at the shoulder-joint. The only other assistance was a policeman, who fainted during the operation. Dr. Drage gave chloroform, then compressed the artery above the clavicle, and with the other hand helped me to ligature the axillary artery. All the light I had was from three or four common candles. The boy made a good recovery.

In 1855 I was called upon to do ovariectomy on a young woman of thirty, with the assistance of my good neighbour, Dr. Drage, his assistants, Mr. Phillips and Mr. Hulme. She progressed favourably for ten days, when she died from septicæmia, the result of an escape of blood into the peritoneum from the pedicle, which had been clamped.

In the same year another case of ovarian tumour came under my care. A young woman, wife of a farmer whom I had attended in several confinements without noticing anything unusual in her condition. She asked me to see her in consequence of enlargement of the abdomen, which she could not account for. I found it was an ovarian cyst; so, with the concurrence of Mr. Spencer Wells, I operated, with the assistance

of my friends who had so ably helped me before. It proved to be a large single cyst with extensive adhesions, which I had great difficulty in separating. In consequence of hæmorrhage from the omentum, I tied and removed a considerable portion of it. I used the clamp for the pedicle. She made a complete and speedy recovery, and is still alive and well. The following year I had yet a third case with rather an unusual history. A big woman, very fat, fifty-five years of age, was aware of the presence of a large tumour in the abdomen, which had existed for more than twenty years. She was married, and first noticed the swelling after the birth of an only child. It had never been proposed to her to have it removed. However, she had become so unwieldy from her enormous size and difficulty of breathing, that she sought my assistance. I believed it to be an ovarian tumour. Mr. Spencer Wells saw her with me, but came to the conclusion that it was a malignant growth and could not safely be removed. She went on from bad to worse, life becoming so unbearable from the enormously distended abdomen, anasarcaous extremities, and difficulty of breathing, that she elected to submit to any operation rather than be allowed to die as she was.

With the same assistants as on the two former occasions, I opened the abdomen (chloroform being used in all three cases), and found a very large multiple cyst without much adhesion, clamped the pedicle, and removed a large mass, which, with its contents, weighed forty-seven pounds. She made a satisfactory recovery, and lived twenty years after, suffering only the inconvenience of a small hernia where the pedicle had been clamped.

One case of atresia vaginæ I have had to deal with. A girl of fifteen, never having menstruated, but for more than a year had suffered from excessive pain in the region of the uterus every month, lasting several days. On examination, I found a roundish tumour about the size of a cricket-ball in the right pelvic region. The urethra and bladder seemed perfect, but there was no trace of vagina. Per rectum was to be felt the round ball-like swelling.

I determined, with the assistance of Dr. Drage of Hatfield, to explore under chloroform. I dissected up a considerable distance ($1\frac{1}{2}$ inch) between the anus and urethra (a sound being in the bladder), and then for several days after dilated and kept the wound open with bougies. Having established a right of way, I continued my dissection almost to the os uteri, when I desisted, and again had recourse to bougies.

During the operations the bearing-down pains were so vio-

lent that it seemed as if the uterus would be expelled per anum. I introduced into the rectum a large india-rubber ball and then inflated it, hoping to prevent the distended uterus descending, but the ball was forcibly expelled by the straining.

I could now feel the os uteri through a tolerably sound vagina, with apparently only a thin membrane between it and my finger; this I perforated with my finger-nail, when a slight discharge of treacle-like-looking fluid escaped, and continued to do so for several days, to the extent, it was estimated, of more than a pint, with little or no pain, but giving great relief. She had a considerable amount of pelvic cellulitis for a week or two, but she quite recovered, and menstruated regularly afterwards. A few years afterwards she asked my consent to her marriage. I examined the vagina, and found that the finger passed about two inches, and then came to a septum or cicatrix, through which I could only pass the first joint of my forefinger. However, she has been happily married several years, but has had no children.

A year or two ago I was attending a healthy-looking girl of twenty-three, a dressmaker, for amenorrhoea. She said she had never menstruated. I treated her with medicine for some time with no benefit, so I suggested to her mother that I should make a more careful examination of her daughter in bed.

I found her normally developed in every respect, save that there was no trace of vagina. The urethra and bladder were perfect. Per anum I could feel neither uterus nor ovaries, and a sound passed into the bladder came in contact with the finger in the rectum. I explained to the girl that she should not marry. Her mother told me she was very attractive to men, and that several offers of marriage had been made to her.

I have seen some eight cases of the extremely painful mucous polypus of the female urethra, which I have always excised, and when there has been a disposition to return, have applied the solid chloride of zinc with success.

I have removed breasts in a great many instances for malignant disease, but in no case without return of it after a longer or shorter period, notwithstanding that I always took away the whole gland, enlarged absorbent glands and any suspicious surroundings, often repeating the operation for recurrent disease in or near the old cicatrix three or four times. I believe it has generally prolonged life and made death less painful.

One patient, a farmer's daughter, aged forty, had a hard lump in the breast, with retracted nipple, which had existed two years. Sir James Paget saw it. He pronounced it scirrhus, but the pain was not great and the growth very slow, and he

advised that it should be soothed in every possible manner, but not excised, as it was of a nature that increased very slowly; and such proved to be the case, for I attended her for it for nineteen years, when it had increased to a large ulcerating mass, from which she died. Notwithstanding all her long years of suffering and discomfort, she told me she would go through it all again, if she could, rather than die.

A young farmer drove here one evening saying that he was unable to pass urine. He told me that ten days previously he had retention of urine when at market; that he went to a doctor, who drew it off for him, and sent him into the Infirmary, where they kept him a week, and he had then inability to pass his water occasionally, but the surgeon said he could find no cause for it. On examining him, I found a calculus lodged in the urethra, just beyond the glans penis. With a scalpel I enlarged the meatus, and with forceps extracted a stone like a large date-stone, very rough and irregular on its surface. He drove home after, and had no further trouble.

On three occasions only have I been called upon to operate for strangulated hernia. Two were femoral in aged females, and the third inguinal in a middle-aged man, in which last case the difficulty I had to contend with was the fact that I could obtain but one assistant, the chloroformist. All the patients did well.

Dislocations of bones have been of frequent occurrence, and have come under my care on an average about once in three years. A dislocation of the foot backwards in a young labouring man, which had existed for several days, I saw in consultation with a neighbouring surgeon. We could not reduce it by extension and manipulation under chloroform, so I divided the tendo-achillis and restored the foot to its natural position with very little difficulty. He recovered without any after trouble.

More than a dozen cases of dislocation of the head of the humerus into the axilla I have had to treat, and in no instance have I failed to replace the bone in its socket in the space of a few minutes by means of simple extension with the heel of my foot in the axilla, and without an anæsthetic. Many other plans have been suggested to me, but the above described simple plan has never disappointed me, and I have felt no inclination to vary my treatment.

I saw in consultation one of these dislocations in a fat woman of sixty years, which had existed for ten weeks. Chloroform was given, and I tried carefully to restore the joint, but, as I expected, failed. She went to Hutton, the bone-setter (notorious in many ways), who gave her much pain, charged her

three guineas, and told her she was cured. I saw her some short time after; the head of the humerus was still in the axilla.

Another instance of long-standing dislocation unreduced I have seen. I did not attempt the operation. He went to a London hospital, and in using extension and manipulation the axillary artery gave way and had to be tied, but the patient did not recover.

A lad I saw who had sprained his knee; as rubbing with liniments did no good, he went to Hutton in town, who said the knee was out of joint. He professed to replace the bones, and sent the boy home. When I was sent for, the popliteal artery was ruptured. He went into a country hospital, had his leg removed, and died.

Yet another patient of Hutton's came to me with displacement of the lower angle of the scapula over the upper portion of the latissimus dorsi muscle. He had taken his fee, but not remedied the mischief, which, when I saw it, had existed some months. I was quite unable to replace the bone beneath the muscle.

Thrice only have I had to reduce simple dislocations of the jaw forward. The subjects were all women, and I met with no great difficulty in either case. The thumbs, well guarded with a towel, pressed as far back as possible on the lower molars, sent the bones into their sockets with a jump.

Inflamed bursæ over or near the patella are very frequent, and the treatment I have found effectual in producing absorption of the fluid is that recommended by the late Mr. Robert Thompson of Westerham. A plaster of ammoniacum c. hyd. spread on leather, worn as long as it will adhere over the swelling, has almost invariably in my hands cured the malady. It is equally efficacious where the bursa over the olecranon is inflamed.

In my hospital days I have on several occasions seen heroic treatment used in these cases with very serious results. Mr. Skey recommended strongly the passing of a seton of several strands of silk through the bursa, which was allowed to remain a few days till it caused considerable discomfort. It was then removed, and if it did not cause suppuration, the fluid became absorbed. I have often tried the plan, but much prefer the plaster treatment. I have also seen the bursa dissected out, and once with fatal result.

Once I have met with a case of inflamed bursa over the tuberosity of ischium, which I attributed to riding on a hard saddle, but now think it was caused by damp, as I have been told by a friend who has lived much in the colonies it occurs from sitting on the damp ground.

Once also have I seen a patient with the bursa under each scapula similarly enlarged.

Once I had a patient, a young woman, with a solid enlargement of the patella bursa, which was painful, and prevented her kneeling. I cut down upon it, and dissected out a fibrous tumour the size of an ordinary dried fig, growing from a small pedicle. There was not much bleeding, and I tied no vessel; but several hours after I was sent for in consequence of hæmorrhage; so I opened the wound, cleared out a clot, and found an artery bleeding from the stump of the pedicle I had divided. I put a ligature on it, and had no further trouble.

Hydrocele comes before us every three or four years. I have invariably tapped them with a trochar and canula and injected iodine, and on no occasion has any secondary treatment been required, although in several instances they had been operated upon before I saw them. A case of hydrocele of the cord in a boy of six years old was cured by simply tapping.

Thrice have I been sent for to see women suffering from severe hæmorrhage from wounds in the vagina. The first was a lady at a garden-party. The stool she was sitting on collapsed under her, and one of the wires of her parasol entered the vagina. She bled profusely; and as pressure did not avail, I passed a curved needle deeply through the mucous membrane and tied the edges together with a suture, with no further trouble than the weakness caused by loss of blood.

My next patient was a woman who was sitting on the chamber vessel when it broke. There was the same hæmorrhage from the vagina, which I arrested in the same manner.

The third was a young lady who, in getting over a stile, fell and actually tore the vagina. The bleeding was not severe and pressure stopped it.

Tracheotomy I have performed once in laryngitis, which gave immediate relief, but the patient died a fortnight after from bronchitis.

I have found the plan of removing tuberculous glands of the neck very successful in preventing discharge from wounds which in many instances had lasted for years, and also in getting rid of unsightly scars.

Nasal Polypus has given me a great deal of trouble; some I have been able to eradicate either by the fauces or through the nostrils, and a few I have failed to get rid of by all the means I could devise.

As regards foreign bodies in the nostrils, frequently introduced there by children, such as horse-beans, peas, glass beads, and slate-pencil, I have always found the ordinary tenaculum

from my pocket-case most effectual in removing them, even after other means have been tried without success.

In a large abscess of the antrum, causing great swelling and deformity, the result probably of a diseased tooth, I extracted the tooth; but as no matter followed, I bored a hole through the socket with a bradawl, letting out a quantity of pus, shortly effecting a complete cure. Once also I tried the same proceeding with success in a case of dropsy of the antrum.

A miller called on me one afternoon in great distress. He said that he was driving in his gig when some large insect flew directly into his ear, causing him agony both of mind and body, as the animal appeared to be scraping against the membrana tympani. With a syringe I soon removed it, and it proved to be a large moth, which had quite filled up the cavity of the ear, but was not visible from without.

A medical friend of mine had somewhat the same experience as the miller. Whilst out driving something flew into his ear, causing him intense discomfort for a considerable time, as he had to go several miles before he could obtain surgical aid. The offender was a large beetle.

Twice I have had to treat broken lower jaws, the result of efforts of unskilled hands to extract teeth.

I have a word to say about the old-fashioned operation of bleeding. During my early pupillage I opened a vein in the arm, or saw it done, almost daily, in most cases because the labouring people believed in it and wished to have it done, spring and fall of the year. Apparently it had no ill effect, they going to work as usual the next day, generally Monday. But I believe there are certain diseases in which if bleeding were practised there would be a good result.

For instance, in acute pleurisy and pleuro-pneumonia, and also in engorgement of the right ventricle of the heart from feebleness, causing congestion of the lungs, I have seen several instances of these diseases which were arrested by the abstraction of 12 or 16 oz. of blood, the patients entirely recovering; and others, when that operation was omitted, with a fatal termination, which in my own mind I felt convinced would have had a fair chance of recovery had it been practised.

Some ten years ago, when in my usual health, in jumping up a bank, one of my plantaris tendons gave way with a snap, sharp and painful at the moment. I believed I had been struck with a sharp flint, for so it felt to me; but I was soon aware of the cause of my discomfort. There was much ecchymosis. I did not lie up, but walked with a stiff leg and everted foot. I was fairly sound again in about a fortnight.

Strange to say, about two months after, a similar accident happened to the other leg, simply from running a few steps to catch a child's ball. The curious part of it is, that a medical friend of mine in town had the same experience in both of his legs, with an interval of several days. I feel fully sure that the brittleness of these tendons is of gouty origin. I have met with no other cases.

Of simple fracture of the long bones I have had my share; of compound fractures none that were not almost immediately fatal from other injuries at the time of the accident. One gentleman I attended for accidents by being thrown from his horse whilst hunting three successive years, each time the tibia and fibula being broken above the ankle. When last I was sent for, his wife asked me to see her husband, as he had broken his third leg. He recovered perfectly.

Many years ago I saw a young woman of nineteen with fragilitas ossium. I might say that she had scarcely a long bone that had not been broken, and some in several places, generally whilst moving in bed, as she was bedridden. Some of the fractures were fairly united, some badly, and others not at all. She was well nourished apparently, but gradually sank and died.

Whatever success I may have had in the treatment of fractures of bones, I have attributed in a great measure to my regular practice of putting up the injured limb fresh daily, after washing, powdering, and making it as comfortable as possible.

A young woman who had lost the sight of an eye from glaucoma applied to me for relief from pain. The globe was much enlarged, and as the other eye was beginning to suffer, I removed the diseased organ without much difficulty, and shortly afterwards fitted her with an artificial eye, which she has worn with comfort.

I have found Bowman's operation of great service in the treatment of diseases of the lachrymal apparatus. I have done it more than a dozen times when there has been obstruction in the punctum or nasal duct, namely, that of laying open the canaliculus, and taking care that it does not close again.

Once I have found a detached eyelash in one of the canals, and once I removed a small calculus of the caruncle the size of a small shot.

Seven times I have operated for hare-lip, and have never had to repent removing too much of the edges of the cleft, although I have excised freely.

I have never had occasion to tie an artery in consequence of aneurism or for an accidental wound.

Troublesome phymosis I frequently relieve by circumcision, and of late years most parents ask me to do it for their newborn boys. For an anæsthetic I rarely use anything but the æther spray.

Chorea in practice almost never has come under my observation, although in some counties it is, I believe, rather prevalent.

The presence of intestinal worms both in children and adults is of course of frequent occurrence. For *tænia solium*, I rely entirely on the fresh liquid extract of male fern; and although I have treated a great many cases, some where the parasite has existed for years, various remedies having been tried—the male fern even without success—I have never failed to dislodge permanently the entozoa, and I think we can rely equally upon santonine for the removal of *lumbricus teres*.

POINTS OF INTEREST IN CONNECTION WITH VARIOUS FORMS OF ABSCESS.

BY

HOWARD MARSH.

All the general facts appertaining to the subject of abscess are so well known, that it would be useless to repeat them. But when we get a little off the beaten track rare instances are met with, difficulties in diagnosis are encountered, and important complications present themselves, which furnish suitable material for a paper in a volume of Hospital Reports. The following notes are fragmentary, yet I hope they may be of sufficient interest to justify their publication.

Diagnosis of Acute Abscess.

There are numerous instances of acute suppuration in which it is essential that pus should be evacuated immediately, and while it is still in small quantity. This is the case in such familiar examples as suppuration in the sheaths of tendons, by the side of the bowel, under the periosteum, in the neighbourhood of the joints in children, and many others. It is therefore important that the relative value of the signs which indicate that pus has formed in a part should be clearly recognised. In the majority of the handbooks of the day, however, this question is passed over in a very cursory manner; while in some, nothing exact enough to be useful can be found, nor is any distinct line drawn between the symptoms of acute inflammation and those which indicate that the stage of suppuration has been reached.

As I have already discussed this subject in a clinical lecture,¹ I will here only briefly allude to it. I believe a student, and even many practitioners, if asked what is the evidence that matter has formed in a part, would answer "fluctuation."

¹ St. Bartholemew's Hospital Journal.

Yet in a large proportion of acute cases fluctuation cannot be obtained, while in others, to wait for its development is to leave matter for several days in tissues from which it ought at once to have been removed. Fluctuation cannot be obtained unless the following conditions are present:—(1) A sufficient quantity of pus; (2) its superficial position; (3) a firm background; (4) a pliant frontage; and (5) absence of great tenderness. But often one or more of these conditions may be wanting in cases of acute suppuration. A thecal abscess is so small, covered with such firm structures, and so tender; an abscess in the axilla, the ischio-rectal fossa, or the abdominal wall is so deficient in a firm background; an abscess around the kidney or in the middle of the breast is so deeply placed and often so painful; and an abscess behind the ribs is so protected, that fluctuation cannot be obtained. In such cases, however, there are other evidences by which the presence of pus can be detected as soon as it has formed, and while it is still in such small amount that it has produced no severe injury of the structures concerned. These are: (1) Elasticity. The centre of an inflamed area, provided it is superficial enough to be closely examined, may be so elastic under the light pressure of a finger as to indicate that pus has formed, though the amount is too small for fluctuation. (2) The surface of the inflamed area may pit on pressure. (3) On careful search, by passing the finger a little firmly over the surface, a spot, which is at first merely tender, but a little later distinctly soft or boggy, is detected. It is due to the fact that matter, originally formed at a deeper level, is now, as the intervening tissues undergo inflammatory softening, approaching the surface. First, this spot is merely tender, because pressure on the surface of the swelling produces painful tension of the abscess wall. A little later it becomes soft as well as tender when erosion involves all the tissues up to the level of the skin. Ultimately the skin itself softens, and yields and projects, so that the abscess "points."

Abscess in Connection with the Ribs.

Suppuration about a rib is generally due to periostitis, which in a large majority of instances is either tuberculous, or a sequel of typhoid fever. In the latter group of cases the affection has its parallel in periostitis of the tibia, humerus, ulna, and other bones. But whether a costal abscess is tuberculous or typhoid in its origin, there are several points in connection with it which deserve attention. (1.) The periosteum

in young subjects (in whom these abscesses are most likely to occur) is easily detached, so that unless pus is evacuated while it is still in small quantity, an inch or more of a rib may be involved, with the result that it may become the seat of rarefying osteitis, extending deeply into its substance and rendering it liable to spontaneous fracture. (2.) If the mischief is seated in the neighbourhood of the junction of a rib with its cartilage, separation between them may occur. I have seen this separation take place between three adjacent ribs and their cartilages. In a tuberculous case repair is quite improbable, and the two free ends, whenever the patient coughs, and even when the pectoral muscle acts, slip over each other, and cause, though not severe pain, yet a sensation the frequent repetition of which is very distressing to the patient. In a lady aged fifty-five, who was dying of tuberculous hip-disease and phthisis, spontaneous fracture of the second rib, or possibly separation between this rib and its cartilage, took place during a not very severe fit of coughing. No repair followed, and in the three months which elapsed before her death the patient was much disturbed by the rubbing of the free ends together, whenever she coughed or moved her arm at all freely. (3.) The mischief may be limited to the anterior aspect of the rib, but this, I believe, is rare. Much more commonly the posterior part of the rib is involved, so that when suppuration occurs pus collects not only in front, but also at the back of the rib, so as to constitute what may be termed a post-costal abscess. (4.) Prognosis in these cases depends very largely on the treatment that is adopted. If treatment is appropriate, recovery, though it may be tedious, will take place in a large proportion of instances: while on the other hand it would be difficult to mention an affection which, when treatment is defective, gives rise to more trouble and disappointment. Indeed, conditions may readily be established, the repair of which, whatever measures are adopted, cannot be secured.

Treatment.—In the first place, any flaw in the aseptic method is equivalent to failure, and no step which can conduce to its maintenance must be neglected. It is necessary to bear in mind the probability that both aspects of the rib—the anterior and the posterior—are involved. And the question arises whether an attempt should be made to complete the necessary treatment at once, or whether it should be carried out in two stages. If the former method is decided upon, after the abscess which presents anteriorly has been opened, search must be made for an opening through the intercostal space adjacent to the affected rib. This opening, which is often very small, must be cautiously

enlarged, and the position and limits of the cavity behind the rib must be fully ascertained. This cavity must then be scraped, and thoroughly cleared of granulation tissue, and sponged out either with carbolic lotion or perchloride solution. A small gauze drain should then be introduced, and the wound dressed aseptically. Should the superficial part of the abscess be large, so that it contains say two or three drachms of pus, it may be better to adopt the operation by two stages. On the first occasion the superficial abscess must be freely laid open, and its cavity thoroughly cleared, drainage being used if necessary. Thus treated, a superficial abscess will soon be reduced to the dimensions of a sinus, from which a small amount of discharge will persist. When this stage has been reached, the sinus, along which a grooved director has been passed, is laid open, and the point where it passes through the intercostal space is ascertained. This opening is then cautiously enlarged, and the post-costal abscess is cleared out. This cavity is then drained as before, and the wound dressed. I have met, in the last four years, with five instances of this form of abscess, and I have usually operated in two stages. For if the operation is completed in one stage, there must, I have thought, be a danger that pus from the superficial part of the abscess may inoculate the freshly divided tissues and deeper part of the wound, and interfere with the immediate healing of these tissues which it is so important to secure. If the intercostal space is very narrow, as it is anteriorly, it may be necessary, in order to obtain room, to cut away a portion of one of the ribs. At present, however, I have never found it necessary to do this.

"Shirt-Stud" Abscess of the Abdominal Wall.

Mrs. S., aged thirty-six, who had had five children, and who was now stout and fat, was admitted with a prominent, distinctly defined swelling, about four inches in diameter, on the front of the abdomen, which at first sight very much resembled an ordinary umbilical hernia. On examination, however, it was noticed that the swelling was below the umbilicus, which was clear of it by an inch and a half, and of natural appearance. The swelling was dull on percussion and uniform in consistence; nothing resembling indurated masses of omentum could be felt in it, nor could any part of it be returned by taxis. There was some tenderness together with redness of the skin over the front of the swelling at its lower part. The patient had noticed the swelling for three weeks, and it had, she said, been steadily increasing in size. Three days later the skin where it had been

red was cedematous, and the patient's temperature was 101° . On cutting down upon it, I found that the swelling was due to an abscess unconnected with any hernial protrusion. The abscess cavity was cleared in the usual manner, and a drainage tube was kept in for five days, when healing seemed nearly complete. A sinus, however, persisted, discharging a little thin serum. This condition of things continued for a fortnight, when a swelling as large as the original one quickly formed, attended with much pain, redness of the skin, and a rise of temperature to 101° . This fresh collection of pus was evacuated, and the cavity was freely laid open; and all its lining of granulation tissue was removed. On now making a close search, I found a pin-hole opening leading through the linea alba, two inches below the umbilicus. When this was enlarged, the finger could be passed into a cavity situated in the sub-peritoneal tissue behind the recti, and holding about three ounces of pus. While I was exploring this cavity the softened wall gave way, and the peritoneal sac was opened. The hole was at once protected and closed by sutures. The abscess was now sponged out, irrigated, and subsequently drained for four or five days. Sound healing followed and the patient has had no further trouble. In this case there was a history of peri-uterine inflammation, following parturition some years before, and the explanation of the abscess no doubt was that chronic peritonitis had at length resulted in suppuration, and the formation of an abscess in the sub-peritoneal tissue behind the anterior abdominal wall. Pus had then found its way through an opening in the linea alba, and had collected in the subcutaneous tissue.

A common feature in the cases I have described is that suppuration takes place behind some firm fascial or muscular stratum, through which pus works its way by a pin-hole orifice, and then collects on a superficial plane, so that the two parts of the abscess are separated from each other by an hour-glass or shirt-stud constriction, as has been pointed out by Mr. Stephen Paget. This anatomical peculiarity may be easily overlooked, and the probability that it exists should be kept in mind whenever a collection of matter has a sheet of strong fascia or a muscular plane for its background, or where, though matter is now superficial, anatomical considerations render it not unlikely that suppuration has had a deeper source. The cases I have related are clear instances, but others less obvious—though not less likely to lead to an oversight—can be mentioned. Thus a subcutaneous abscess in the neck may be the superficial part of a collection of pus derived from suppuration in a gland lying at some distance beneath the deep

cervical fascia. Or pus found on the front of the mammary gland may have formed behind or in the mid-substance of the gland, and have travelled towards the surface by a narrow passage through the gland, so that the abscess is of the "shirt-stud" variety. Oversights, in such cases, can only be avoided when the parts are thoroughly examined.

In dealing with this kind of abscess, the treatment, as I have mentioned above, may be conducted either in a single or in two stages.

The operation in two stages should be adopted where the deeper part of the abscess is in contact with important structures. Had the abscess in Mrs. S.'s case (p. 244) been followed through the abdominal wall at first, it is probable that, in the clearing away of granulation tissue, the peritoneum might have broken through, and pus might readily have escaped, perhaps unnoticed, in considerable quantity into the abdominal cavity. As it was, though the peritoneum gave way, the accident was detected and no harm followed.

In a case in the Hospital two years ago, a man aged twenty-seven had an abscess containing about an ounce of pus over the seventh and eighth ribs, in a line with the nipple. Its deep part had burrowed behind the ribs, so that there was a cavity about two inches in its horizontal extent. To clear this out was a somewhat difficult proceeding, and one which would have been by no means facilitated had the structures concerned been bathed in pus.

Sub-Pectoral and Sub-Gluteal Abscess.

There are two situations in which, as the result of the anatomical arrangement of the structures concerned, an abscess allowed to become septic may lead to very grave, and even fatal consequences. These are the cellular planes beneath the pectoralis major and the gluteus maximus. The danger arises from the fact that the loose bed of connective tissue in which suppuration originally occurred extends widely in a horizontal direction beneath firm structures through which pus cannot make its way towards the surface. In the instance of the axilla covered in by the pectoral muscle, pus may make its way forwards beneath the pectoralis to the middle of the sternum, backwards beneath the scapular muscles, and downwards in the arm along the vessels and brachial plexus. It may even, as it burrows in the cellular tissue along the lines of least resistance, make its way

into the shoulder-joint. Three years ago a middle-aged man was admitted into Abernethy Ward who had had suppuration in his axilla around tuberculous glands. The abscess had been opened two months before by a simple incision, and a poultice had been applied. The patient now had an evening temperature of 101° , and two sinuses were discharging freely, one on the thoracic side of the axilla, the other at the upper and inner part of the arm. On examining the upper sinus, it was found to run forwards in different directions, so that the pectoral muscle was completely undermined. The lower ran down the arm along the vessels and brachial plexus half way to the elbow. A large counter-opening was made through the middle of the pectoralis major, and the whole of the granulation tissue was scraped away and a drainage tube inserted. The lower sinus was laid open, scraped, and drained. The temperature now went down to normal, and the patient's condition improved. But in a few days suppuration again became active. The sinuses were now freely syringed with carbolic lotion (1 in 60), and then daily with boracic acid lotion. In spite of all that could be done, however, suppuration continued, and a fortnight later it was found that the shoulder-joint had become involved, and was now freely suppurating. Three weeks later I removed the arm at the shoulder-joint. It could now be seen that the whole area of the axilla, and the space between the neighbouring muscles for a considerable distance, was one large suppurating cavity. The walls of this cavity and of its recesses were scraped, and as far as possible disinfected, and the shoulder-joint was freely treated in a similar way. The patient improved for a time, but he was now pale and weak, and his powers of repair seemed to be exhausted. Albumin was found in the urine, no doubt from lardaceous disease, and he died two months later.

Sub-gluteal Abscess.

In past years I have met with four cases of death from exhaustion resulting from suppuration beneath the gluteus maximus, followed, when the abscess was opened, by septic infection. Two of these may be briefly related. A man aged thirty-eight had an abscess beneath the gluteus maximus, apparently tuberculous in origin. This was opened at the lower border of the muscle. The operation was followed by general illness and a temperature of 102° , together with a large daily discharge of pus. On his admission a few days

later, the cause of suppuration was not apparent, for the hip-joint was quite normal, as were also, so far as could be ascertained, the sacro-iliac joint and the spine. It seemed most probable that suppuration was due to a primary deposit of tubercle in the soft structures. This view was confirmed by another part of the case, which I think is sufficiently interesting to claim a passing notice. A few weeks later the inner half of the right clavicle became the seat of a fusiform swelling, the shape and steady increase of which raised the suspicion that it must be a new growth. This suspicion was increased when the clavicle suddenly broke while the patient was in the act of raising himself on his elbow in bed. Believing that the bone was involved in a sarcomatous growth, I cut down upon it for the purpose of removing its inner two-thirds. I then, however, found that it was the seat of osteitis, which had so softened it that it had snapped across. Spontaneous fracture of the shaft of one of the long bones, as the result of tuberculous disease, is met with from time to time, but it is certainly rare. I have myself seen it only on four occasions. Once in the tibia, once in the ulna—both in children; in another case, as mentioned at page 243, the second rib, in a case of phthisis, broke during a fit of coughing. The present is the fourth case. So much stress is usually, and justly, laid on spontaneous fracture of a long bone as evidence of new growth that these instances may be mentioned as a reminder that, occasionally at all events, tuberculous osteitis may produce the same result.

But to return to the case of sub-gluteal abscess. After it had been scraped, and, as far as possible, rendered aseptic, the abscess in the course of a month almost healed; but then there was a renewal of suppuration, and an evening temperature of 101° . This state of things continued, and he lost ground, quickly wasted, and finally died of exhaustion three months afterwards. It will be enough to briefly record one further case. A man, aged twenty-six, was admitted some ten years ago with a large abscess under the gluteus maximus, extending downwards beneath the fascia lata on the outer side of the thigh, and due to disease of the sacro-iliac joint. About a pint of pus was evacuated by an incision through the gluteus towards its lower part. The cavity was found to extend upwards nearly to the iliac crest. A drainage tube was passed in this direction, and a counter-incision was made through the fascia lata in the upper third of the thigh. Great difficulty, however, was found in draining this large cavity through a healthy and so thick a muscle as the gluteus. Pus collected at different parts, and further openings were necessary. The patient ultimately

died. From my experience of these examples, I should be inclined in any future case to lay the subgluteal space freely open by an incision in the direction of the muscular fibres, clear the cavity, and then to pack it with aseptic gauze, and allow it to fill up by granulation. Great care would be essential to avoid sepsis, especially during the action of the bowels. An extra covering of blue wool should on each such occasion be applied over the dressings already in use; some strong disinfectant should be placed in the bed-pan. Afterwards the dressings should be removed, and the whole wound should be syringed out with weak carbolic lotion or weak perchloride lotion, and be re-dressed. The patient may with advantage spend much of his time in the prone position. Different abscesses are amenable to different forms of treatment. In the kind of abscess I have described, one, that is, which occupies an extensive plane of areolar tissue, and is covered by a healthy muscle, mere incision and scraping, and either immediate closure or drainage, followed by aseptic dressing, may not suffice. The cavity must be exposed and left to heal by granulation under strict aseptic safeguards.

Post-Mammary Abscess.

An abscess, the cavity of which, after it has been freely opened, may close very slowly, is that which is termed post-mammary, and which is situated between the back of the breast and the thoracic wall and the pectoralis major. Here, as in the subpectoral and subgluteal forms, suppuration occurs in a plane of areolar tissue overlaid by a firm structure, which shuts it down, and beneath which it can burrow widely in a horizontal direction. In former times, when septic infection almost invariably occurred, an abscess behind the breast was followed by wide burrowing over the thoracic wall and the development of pockets and sinuses which remained for many weeks, or even months, showing no tendency to heal. I remember two cases in which, in order to get at and expose the various ramifications which had been formed—all other means having failed—the breast was amputated. In another case healing was delayed for nine months. When a post-mammary abscess is originally opened, needless to say under strict asepsis, an incision should be made two and a half inches in length along the inferior crescent of the gland. The gland should then be raised so that all parts of the abscess cavity can be examined, and any pockets detected, freely opened, cleared, and irrigated, and then lightly filled with iodoform

gauze, which has been soaked for twenty-four hours in a solution of one in forty carbolic acid in sterilised water. The main cavity should be lightly packed in a similar manner. Thus managed, these abscesses heal without delay. The arm in the meantime should be bandaged across the chest, so as to keep the pectoral muscle at rest.

Chronic Subperiosteal Abscess.

If they are not opened early, abscesses under the periosteum may be attended with grave consequences. One is, that pus retained beneath the periosteum, which has become thickened by inflammation, may burrow along a narrow track for some distance, and at length make its way into one of the joints. This very serious result took place in the following case:—A boy aged fourteen was admitted into the Hospital three years ago with a small abscess on the external aspect of the thigh, about five inches below the great trochanter. When opened, it was found to be under the periosteum of the femur, the outer surface of which could be felt to be bare and rough over an area an inch long and half an inch wide. The cavity was cleared of granulation tissue, the wound healed within a fortnight, and the boy was discharged. Three weeks later he was brought to the Hospital again, evidently suffering severe pain in the corresponding hip-joint (which had previously been perfectly sound), and with a temperature of 103° and marked general illness. The limb was flexed on the pelvis, and any movement of the joint was very painful. Investigation showed that the original abscess had refilled, and that burrowing had taken place into the hip-joint, which, when opened by an anterior incision, passing between the tensor fasciæ femoris and the sartorius, was found distended with pus. The patient said that he had, though with some pain in the seat of the original abscess, been walking freely on the limb until two days before, when he was quite suddenly attacked with great pain in the joint and inability to stand. A few days after his re-admission, in the hope of diminishing suppuration, and in order to secure better drainage and an opportunity of irrigating the joint, I removed the head of the femur. The boy, however, continued to lose ground, and died of exhaustion within two months. His parents declined to allow amputation of the limb. The passage under the periosteum, by which pus had burrowed into the joint, was not larger than an ordinary cedar pencil, but it was no less than five inches in length.

Diagnosis between an Abscess and a New Growth.

The diagnosis of abscess, whether acute or chronic, which is usually quite easy, may be very difficult. Every one is familiar with the fact that a chronic abscess and a fatty tumour may present a very deceptive resemblance to each other, especially when a chronic abscess is overlaid by a considerable thickness of subcutaneous fat. The liability to error, however, in its most serious form, arises chiefly out of the similarity which not rarely exists between inflammatory swellings and new growths. For a discussion of this subject I would refer to former papers in St. Bartholomew's Hospital Reports, vol. xxiii. p. 148, and vol. xxviii. p. 7. But I may here relate the following remarkable case, in which the conditions present were so deceptive that a correct diagnosis was arrived at only after a deep exploratory operation had been undertaken, and a very careful and persistent search carried out.

Ossification of Displaced Periosteum.

A boy, aged sixteen, a patient of Dr. Uthoff of Brighton, had a swelling in his right iliac fossa, which had been gradually developed in the course of about three months. This swelling, which was at first deeply placed, now filled up the whole fossa, and projected forwards, so that its wide and low-crowned summit was nearly on a level with the anterior iliac spine. It was everywhere hard and unyielding, and presented the general appearance of a large periosteal sarcoma. On two occasions, before I saw the case, when an exploring needle had been introduced, its point had been arrested by coming in contact with what appeared to be either bone or a hard osteo-sarcoma. As it was important to set any possible doubt as to the nature of the swelling at rest, it was explored through a free incision. On dividing the iliacus, by which it was covered, I found this muscle perfectly healthy. The swelling itself, when exposed, was of bony hardness, and at first no evidences of inflammation were to be seen, and the fear that the case was one of sarcoma seemed almost converted into a certainty. On extending the incision in an upward direction, however, in order to completely expose the whole anterior aspect of the swelling, as a preliminary to cutting into its interior, I noticed that, close to the iliac crest, about two inches behind the anterior

spine, the iliac muscle was matted and adherent, and of a tawny colour, while a further search disclosed some granulation tissue. Through this a curved director passed into what seemed a large cavity, from which about three ounces of pus escaped. Through this opening, when it had been enlarged, the finger passed into the hollow of the ilium, the ventral aspect of which could be distinctly felt, and by turning the tip of the finger forwards, that is, towards the anterior abdominal wall, a plate of bone was encountered which made a complete dome to about the external half of the fossa, and it was this arched roof which formed the front aspect of the abscess. The explanation of this condition seemed clearly to be that in the first place a collection of matter had formed in the iliac fossa between the bone and the periosteum, constituting a subperiosteal abscess, so that the membrane had been separated and raised into a kind of tentorium, and that while it was maintained in this position by pus collected beneath it, it had, by virtue of its osteogenetic function, undergone ossification. It is a noteworthy fact that the formation of this abscess had been unattended with pain, or with tenderness on even firm pressure. The absence of pain, it is easy to understand, was due to the fact that the abscess, which was probably tuberculous, had formed slowly, and had never become tense; further, there was no tenderness on pressure because the parts superficial to the bony shell were quite normal, while the abscess beneath this shell was so completely protected that external pressure was not transmitted to it. The cavity was drained and irrigated daily, and strict asepsis was maintained. Favourable healing occurred, though a sinus remained for several weeks; but this at length closed. The boy is now—after the lapse of eighteen months—quite well, and takes active exercise, including hunting, without any restriction. It is interesting to remark that the swelling has entirely disappeared, so that the iliac fossa has regained its normal depth and hollow shape. Thus, evidently, the bone deposited in the displaced periosteum has, like the temporary or provisional callus around a fracture, been completely absorbed, and the periosteum has regained its normal position.

Ossification of the deep layer of the periosteum, when it has been raised by the collection of matter beneath it, is an event the possibility of which it is necessary to bear in mind in cases of obscure swellings in connection with the bones in childhood. It is well known that in infantile scurvy, when hæmorrhage has occurred under the periosteum of the femur, for instance, the swelling often disappears quickly, the effused blood under-

going rapid absorption. Swelling sometimes, however, is more persistent. In these instances, as in the case related above, it seems not unlikely that bone is deposited in the displaced periosteum. Afterwards it is, like temporary callus, gradually absorbed.

Specimen No. 39a in the Museum is a remarkable example of ossification of the periosteum of the femur after it had been separated, for nearly half the length of the bone, by the formation of pus beneath it, as the result of acute periostitis, of about a month's duration, in an infant one year old. The bone has been sawn across just above the condyles. The periosteum for some distance is expanded like an open umbrella or an egg-cup. Thus distended, it has undergone ossification, and through the bony cavity thus formed the original shaft of the femur passes like a central stem. The child died of intercurrent bronchitis. The specimen was presented by Mr. Bowlby.

*Carcinoma of the Sigmoid Flexure of the Colon
Imitating Iliac Abscess.*¹

A lady aged fifty-one had a swelling in the left iliac fossa, which had been noticed about three months, and which was gradually increasing. It occupied the usual position of an iliac abscess, such as might depend on Pott's disease of the spine, and presented the same kind of elasticity that is present in an abscess covered with some thickness of soft parts. The patient complained of very little pain, except when an attempt was made to extend the limb, which she kept habitually somewhat flexed. Her evening temperature was 102.3° . No spinal disease could be detected. On examination, this swelling presented all the usual symptoms of an abscess, while the temperature in the morning was usually 101° , and that in the evening between 102° and 103.5° . Yet a suspicion was entertained that the swelling might prove to be a new growth, partly on account of the patient's age, and the absence of any condition on which an abscess might depend: and partly because, as all who have had much experience in the diagnosis of abscesses are well aware, the physical symptoms are sometimes very deceptive. It was therefore determined to perform an exploratory operation. When this was done the swelling was found to be malignant. The patient died a few weeks later, and on post-mortem examination the growth proved to be carcinoma, originating in the large intestine, where it lay on the brim of the

¹ I may refer the reader to a paper on this subject in vol. xxiii. of these Reports.

pelvis. In this case the temperature differed, it will be noticed, in no way from the temperature observed in cases in which suppuration is present. Such a temperature, together with the physical characters of the swelling, rendered the case in the highest degree deceptive. Another remarkable circumstance connected with the disease, was that although the growth originated in the wall of the bowel, it never produced any intestinal symptoms, the bowels acting regularly throughout, and there being at no time any griping, vomiting, or distension.

Sinus in the Cheek depending on an Unsound Wisdom Tooth.

A boy aged sixteen had been subject for five months to the occasional formation of a small abscess in the cheek, a little in front and below the orifice of the parotid duct. This abscess, appearing first as a small induration in the substance of the cheek, and then gradually enlarging and discharging a drop or two of pus, seemed for a time to have soundly healed. In the course of three or four weeks, however, the swelling recurred, a drop or two of pus escaped, and the trouble quieted down again. This succession of events had taken place several times. On very careful examination, nothing could be felt beside the indurated swelling, which was not bigger than a large pea. The exact origin of the swelling appeared uncertain. It was thought that it might be tuberculous. On the next occasion of its enlarging, and before the pus had been discharged, I cut into the swelling and searched its floor with a fine probe. The probe immediately passed horizontally backwards for a distance of nearly two inches, until it came into contact with the wisdom tooth of the upper jaw on that side. This was found to be carious, and was removed. The sinus then quickly healed. When it was found that the track led back to the tooth, the cheek was very carefully searched for any line of induration. None, however, could be detected, and the cheek between the swelling and the wisdom tooth, on palpation, appeared to be quite healthy. This case afforded a very clear illustration of the fact that when there is a relapsing swelling going on to suppuration, some source of irritation—generally connected with bone—is present, though its exact nature may be very obscure, and that no treatment will succeed until this irritation has been traced to its source, and its cause detected and removed.

Punctured wound extending through the ischio-rectal space into the pelvis—Suppuration, and burrowing of matter through the obturator foramen into the adductor region of the thigh on both sides.

A man aged thirty-two was admitted into the Hospital, having fallen on the end of a strong stake, which had passed by the side of the rectum up into the pelvis for several inches. Severe hæmorrhage had occurred, and was arrested only by firm plugging of the wound. Suppuration followed, but after continuing for several weeks, almost ceased. A few days later the patient complained of pain in the hypogastric region, and an indurated swelling was discovered through the abdominal wall on the right side of the bladder. This swelling was followed by the development of an abscess in the corresponding adductor region of the thigh. When the abscess was opened, a long probe introduced into its cavity passed into the pelvis through the obturator foramen. The abscess, after discharging for about a week, closed and remained soundly healed. A little later an abscess made its appearance in the adductor region of the left thigh, in a position exactly similar to that occupied by the abscess on the right side. This was opened, and when a probe was passed into its cavity it ran through the obturator foramen and into the pelvis in exactly the same manner as had been observed on the right side. This abscess also closed, and the patient made a good recovery. It seemed clear that, following the injury, suppuration occurred around the bladder, and that pus found its way, first on the right side and then on the left, along the obturator nerve and artery, and so passed through the obturator opening into the adductor region of the thigh.

A CASE OF
FRACTURED BASE OF THE SKULL WITH
REMARKABLE EYE-SYMPTOMS.

BY

H. G. WOOD-HILL

(*Ward-Dresser of the Patient*).

WITH A NOTE BY MR. ALFRED WILLETT.

C. D., age 34, asylum attendant, was admitted to Pitcairn Ward, November 18, 1898, under the care of Mr. Willett.

On October 26, 1898, the patient mistook the two doors of a ward, from each of which a staircase led, one going up and the other down; he intended to pass through the former, but went through the latter, with the result that he fell down a flight of eight stone steps head foremost. He was picked up unconscious and was at once attended by the asylum staff.

There were two lacerated wounds on the left side of the forehead, neither wound extending down to the bone. Both eyes were completely closed by blood extravasated into eyelids, and there had been bleeding from both nostrils. The next morning he vomited a quantity of disintegrated blood.

He remained more or less unconscious for nearly sixty hours, and for a few days afterwards talked incoherently and at random.

On October 28 and 29 there was a slight discharge of a straw-coloured fluid from the left nostril. There has been somewhat severe subconjunctival hæmorrhage, coming from behind forwards, in the left eye.

The wounds healed by first intention; the temperature was normal throughout.

Soon after the swelling of the eyelids had subsided, permitting an examination of the eyes to be made, he was found to be totally blind in the left eye, together with loss of ocular

movement on the same side. Before the accident the patient thinks his vision was perfect.

Condition of the patient on admission to this Hospital, November 18. He seemed healthy.

Limbs.—Nothing abnormal noted. No paralysis nor paresis: no rigidity nor muscular wasting. Movements natural; reflexes normal; grip of hands firm and equal.

Abdomen and Chest.—Quite normal. No area of anæsthesia.

Head.—There was a crescentic scar over the left temporal region two inches long, with some tenderness on palpation in its neighbourhood.

There was slight paresis of muscles of the left side of the face, also ptosis and paralysis of the levator palpebræ on the same side. The tongue was protruded straight.

On the left side there is an area of absolute anæsthesia situated between the lacrimal and the nasal crease, and extending on to the ala nasi. The mucous membrane of the left nostril was anæsthetic, also the lower part of the ocular conjunctiva where supplied by inferior palpebral branch of second division of 5th nerve.

Eyes.—No proptosis; no recession; no tenderness on pressure; tension normal and equal.

Right Eye.—The extrinsic muscles were normal. The iris acted sluggishly to light, actively on accommodation; there was loss of power in the ciliary muscle. The conjunctiva was slightly injected, and there were two small patches of ecchymosis to the outer side of the corneal margin. There was no photophobia and the cornea was normal. The pupil was regular. Lens normal. Media clear. Fundus natural. The optic disc was rather pale, patchy greyish; cribriform appearance well marked; small vessels seen distinctly.

Far vision = $\frac{6}{18}$ p., not improved by glasses.

Near vision = Sn. $3\frac{1}{2}$ at 7 inches, c. + 4 D sph. = Sn. $1\frac{1}{2}$ at 7 inches.

Left Eye.—Extrinsic muscles = Outward movement normal: all other movement almost completely lost.

Iris = paralysed. Conjunctiva slightly injected. Some lacrimation. Cornea not anæsthetic: old corneal nebula. Pupil widely dilated and regular. Lens normal. Media clear. Fundus vessels small.

Disc = uniformly white.

Vision = none: not even perception of the strongest light.

Mr. Vernon examined the patient. He considered that the patient had some laceration of the left optic nerve involving the chiasma; though he thinks that the whole of his symptoms

may be due to pressure of blood clot, which must extend back to the chiasma, since the disc of the right eye is undoubtedly affected. Mr. Vernon considered he might regain power over

FIELD OF VISION.

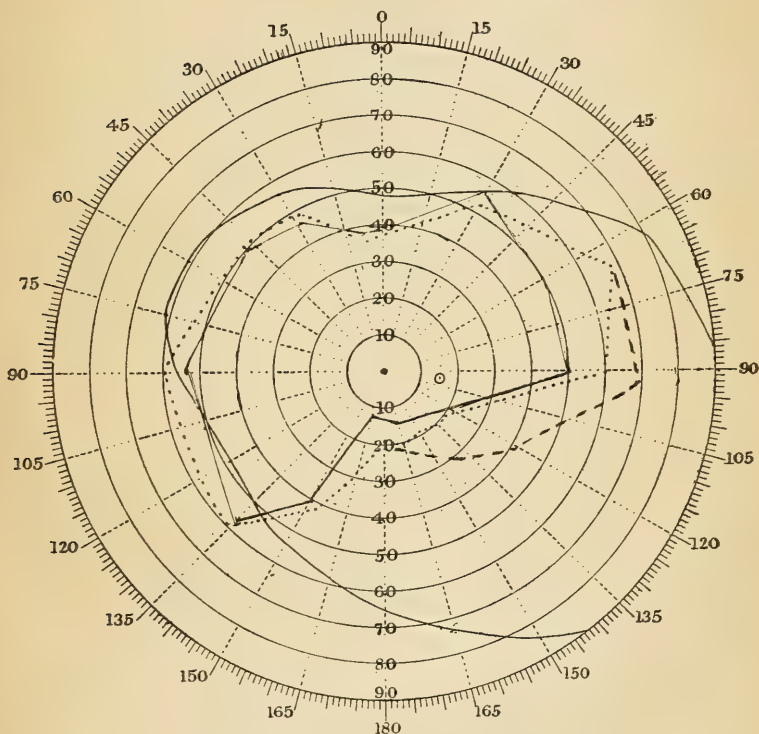
Right Eye.

FIG. 10.

Taken November 19, ———
 " " 29,
 " December 6, - - - -

the extrinsic muscles of his eye, but as regards eyesight in the left eye, he thinks this must be considered a case of irrecoverable amaurosis. Mr. Vernon also gave a very guarded prognosis as to his ultimate vision in the right eye.

This diagnosis practically concurred with the view which Mr. Willett had taken of the case.

During the patient's stay in this Hospital, his mental condition was perfectly sound and rational; he complained of no headache, nor indeed were any cerebral symptoms in evidence. His ocular symptoms remained practically unaltered, with the exception of the patient's strong belief that he is regaining more acute vision in his right eye; also the extension of the field of vision in a nasal direction, as shown by the chart, though how far this may be due to the personal equation of the patient it is difficult to say.

To sum up the case: The patient has a fracture through the base of his skull, almost certainly involving the optic foramen, and implicating the cribriform plate of the ethmoid, since the nasal branch of the 5th is affected after giving off its inferior trochlear branch—that is, just as it quits the orbit and enters the cranial cavity through the anterior ethmoidal foramen.

Concerning the exact lesion of the optic path there must be some doubt. That the optic nerve is not torn distal to the entrance of the arteria centralis retinae is obvious. That the injury is seated cortically or in the left optic tract is impossible, since the former does not account for the mydriasis and cycloplegia present, while in neither would one find complete loss of sight in one eye.

I. It is just possible that pressure of clot may alone account for the patient's entire symptoms; if so, the clot must include the chiasma, since the partial temporal hemianopia is surely too significant a sign to be neglected. If it were not for this, it is conceivable that the patient's loss of acuteness of vision and changes in the disc of the right eye might be explained solely by the loss of blood and general visual shock; this might also explain the partial iridoplegia and cycloplegia of the right eye.

II. That the symptoms may be partially due to tearing of the left optic nerve and laceration of the chiasma is most probable; this, together with blood clot pressing on the 3rd, 4th, and branches of the 5th nerves, would explain all the patient's symptoms. That the ocular motor nerves are also torn is not likely, since the 6th nerve—the one most exposed in such injuries—is the very one to have escaped in this patient.

The case is one of considerable interest, and fortunately the patient is in a position to be kept under observation in the future. For the present it must be described as a case of fracture of the base of the skull, with internal and partial external ophthalmoplegia of the left eye, together with partial hemianopia of the right eye.

NOTE BY MR. WILLETT.

I think this case of lesion of an optic nerve producing total blindness is worthy of being placed on record in our Hospital Reports.

Although, owing to the great swelling of the eyelids and the patient's unconscious condition, no sufficient examination of the eye or any testing of vision was possible for some days after the accident, and that therefore a link in the chain of evidence is wanting, yet I think the fair presumption in this case is that the loss of vision in the left eye was coincident with his accident, and not a secondary effect of it.

The dresser of the patient, Mr. H. G. Wood-Hill, has taken such great pains over the preparation of the notes, and has worked out the clinical features of the case so very thoroughly, displaying a highly commendable knowledge of ophthalmic surgery, that I find much added satisfaction in asking that this brief communication may appear in the volume of Reports for 1898.

REPORT OF OPERATION CASES FROM MR. WALSHAM'S WARDS.

BY

W. J. WALSHAM,

AND HIS HOUSE-SURGEONS,

GILBERT SMITH AND S. P. HUGGINS.

During my editorship of the Hospital Reports it always seemed to me that it would add to the value of our annual volume and its interest to old Bartholomew's men if the physicians and surgeons were to publish a report of the cases in their wards somewhat on the lines here attempted. I first thought of giving some account of all the cases that have come under my care during the time I have been surgeon, but from want of time I have been compelled to limit this review to the first six months of that period, and to what are known in hospital practice as operation cases—that is, cases admitted to the wards for operation, in contradistinction to such surgical cases as are treated by rest, medicine, or apparatus. I find that out of a total number of 372 patients admitted to my wards from 1st April to 30th September—namely, Kenton, Lawrence, and half of Harley—145 came under the category of operation cases.

In all of the operation cases, except in a few of the less important, the patient was kept in the Hospital for a few days to a week or more, and generally in bed, for the purpose of being thoroughly and efficiently prepared for the operation he had to undergo. The strictest antiseptic precautions were employed in every instance, even for the most trivial operations, such as the subcutaneous division of fasciæ or tendons. The following notice is now posted up in each of my wards for

the instruction of the dressers in the preparation of the operation area, so as to ensure uniformity in the method:—

PREPARATION OF CASES FOR OPERATION.

1. Shave the surface to be prepared (if necessary).
2. Scrub well with soap and water.
3. Rub in ether.

Wash your hands and sterilise them in biniodide of mercury lotion (1 in 1000).

4. Wash surface with biniodide of mercury lotion (1 in 5000) for two minutes.

5. Wash this off with biniodide of mercury lotion (1 in 2000).

6. Apply:—

(a.) Sterilised carbolic gauze wrung out in biniodide of mercury lotion (1 in 4000).

(b.) Protective india-rubber tissue wrung out in carbolic acid (1 in 20).

(c.) Absorbent or boracic wool.

(d.) Bandage.

This preliminary preparation is generally performed by the dresser; for the especially important cases, as abdominal and cranial operations, by the house-surgeon himself, the house-surgeon's and dresser's hands being first properly sterilised by well washing in soap and water, paring down and cleaning the nails with an aseptic nail-brush, and then thoroughly soaking in the biniodide of mercury and spirit lotion.

After the patient had been anaesthetised and placed on the operation table, the bandage and outer dressing were removed by the nurse. Warm sterilised towels soaked in carbolic lotion, 1 in 20, were next placed over sterilised mackintoshes around the seat of operation and over the blankets covering the patient both above and below, so that there might be no chance of any instrument accidentally not replaced at once in the lotion coming in contact with any material which was not perfectly aseptic. The aseptic gauze dressing having been now removed by a dresser whose hands had been previously sterilised in the way already mentioned, the skin was again sponged thoroughly over with the biniodide and mercury spirit-lotion. The hands of the surgeon, assistant-surgeon, house-surgeons, and dressers having been rendered sterile in the ways already mentioned, portions of the skin of their fingers were snipped off with sterilised scissors and forceps, and placed in culture-tubes, so that if anything abnormal occurred in the healing of the wound

the source of the infection could be located. For the same reason portions of the patient's skin, of the skin of the nurse's hands, of towels and sponges, were treated in like manner. This is found to be an excellent routine practice, as it makes each person desirous of not being the culprit, and adds to the enthusiasm with which the hands, &c., are cleansed. The instruments were all boiled under the house-surgeon's supervision immediately before the operation, and then with sterilised forceps placed in sterilised trays containing carbolic lotion, 1 in 20. The ligatures were prepared and kept by the house-surgeon, and boiled immediately before the operation. During the operation they were handed as required to the surgeon or his assistant by a dresser told off for this purpose with sterilised hands, but even then were not touched by his hands, but by sterilised forceps. The wounds were dressed with double cyanide gauze, the first layer being wrung out in 1 in 2000 biniodide of mercury lotion, with a covering of sal-alembroth wool. All bleeding having been carefully stopped, and the blood pressed out from the wound, drainage, as a rule, was not employed. The part was placed at as absolute rest as possible, and the wound not disturbed for a week or ten days, or in some instances for longer, so as to ensure that physiological rest which is so essential for an aseptic course. At the first and at the subsequent dressing, should the skin not be completely healed at the first, the same strict antiseptic measures were taken.

I am aware that there is nothing particularly new in all this, but I call attention to the fact that this has been my routine practice (and, with perhaps some slight modification in details, I understand it is the routine practice of my surgical colleagues), because it has come to my knowledge that it has been said, evidently by persons totally unacquainted with the methods of the Hospital, that antiseptic surgery is not practised at St. Bartholomew's. Speaking for myself, I can only say that ever since I have been an officer of the Hospital I have employed antiseptic methods according to the lights of the period, and I believe that my former chief, Sir Thomas Smith, was the first to practise them in London, for I well remember his sending his house-surgeon to Edinburgh to study Lord Lister's (then Mr. Lister) method when the antiseptic doctrine was first promulgated.

The present report of operation cases extends from 1st April 1898 to 30th September 1898, that is, during the period that Mr. Gilbert Smith was my senior house-surgeon and Mr. S. P. Huggins my junior, but it does not include the operations performed by my assistant-surgeon, Mr. D'Arcy Power, during my

six weeks' vacation, the operations performed by him on patients of his own in the beds he has in my wards, nor the minor operations, such as amputations of fingers and toes, opening abscesses, &c., done by the house-surgeons. The number of operations performed by myself in the theatres during this time amount to 145, and are classified as follows:—

TREPHINING THE SKULL.

The operation of trephining the skull was performed eight times on seven patients,—three times for abscess of the brain following otitis media on two patients, three times for injury, once for tuberculous disease of the frontal bone, and once for chronic hydrocephalus.

Of the two cases of abscess of the brain, one recovered completely; the other was trephined twice, at an interval of eight days, on opposite sides of the head, but died suddenly three weeks after the last trephining.

Of the cases of injury, two recovered, and one died on the day of admission to the Hospital from the injury to the brain, without regaining consciousness.

The case of tuberculous disease of the frontal bone recovered without any untoward symptom.

The case of hydrocephalus was greatly improved during its stay in the Hospital, but died one month after its return home from convulsions.

In all the cases the head was completely shaved prior to the operation.

Case 1.—The first case of cerebral abscess occurred in a girl aged 14 (No. 794 Lawrence¹), who was admitted with severe headache, vomiting, and a foul discharge from the right ear. Her temperature was normal, the pulse 50, the pupils were dilated, their reaction was defective, the optic discs were ill-defined, and the retinal blood-vessels very congested, especially on the left side. The patient was drowsy and her cerebation slow; there was no aphasia nor paralysis, but her gait was unsteady. There was no tenderness over the corresponding mastoid region, but an enlarged lymphatic gland was felt below the angle of the jaw on the right side. The slow pulse, low temperature, headache, vomiting, optic neuritis, and slow cerebation, made it probable that she had a cerebral abscess, the result of middle ear disease. It was therefore decided, after clearing out the mastoid antrum, to explore the temporo-sphenoidal lobe of the

¹ The numbers refer to the "registered number" in the Hospital Case-Books.

brain, and if no pus was found there, then the cerebellum. The absence of rigors and of a septicæmic temperature excluded lateral sinus mischief; the low temperature and slow pulse meningitis. The mastoid antrum and cells were accordingly laid open with a chisel through a curved incision behind the ear extending from the apex of the mastoid process upwards over the vault. Pus was discovered in the antrum, and this cavity was made to freely communicate with the attic of the tympanum by cutting away the posterior wall of the external auditory meatus. These cavities having been syringed out with perchloride of mercury lotion (1 in 2000), they were plugged with iodoform gauze, the external incision was prolonged, and the cranial cavity opened with a chisel immediately above the supra-mastoid ridge. The opening was then enlarged with a rongeur forceps, and the dura, which bulged into the wound, opened. A large-sized hydrocele trocar and cannula was then passed into the temporo-sphenoidal lobe, and an ounce of very offensive pus was let out. There was an immediate increase in the rate and tension of the pulse. A large rubber drainage tube was next inserted and the wound closed. The patient improved rapidly after the operation. Mr. Gilbert Smith dressed the wound and irrigated the abscess cavity through a small tube passed through the larger rubber tube every three hours for the first twenty-four hours, and every six hours for the next three days, and every eight hours for the week following; after this twice in the twenty-four hours. The amount of drainage that took place into the dressings between the periods of the irrigations was insignificant compared with what was removed during each irrigation, and almost on every occasion that the wound was dressed the tube was found blocked. I cannot help feeling that the very satisfactory termination of this case was in great part due to the enthusiasm with which the after-treatment was carried out by Mr. Gilbert Smith. The patient never had an unfavourable symptom of any kind, and left the Hospital completely recovered, but with a slight oozing from the right ear.

Case 2.—The second case of cerebral abscess occurred in a man aged 36 (No. 1217 Kenton). He had suffered with a discharge from both ears for many years, and two weeks ago had had influenza. Three days ago he complained of headache, and on admission was delirious and vomited a little. His temperature was 103° , his pulse normal; the pupils were dilated, but reacted normally. The right disc was rather indistinct. There was no evident paralysis. He was very irritable and violent, and wandering in his speech. There was a foul dis-

charge from the right ear, with some tenderness and œdema in the corresponding mastoid region. The discharge from the left ear was less foul, and the tympanic membrane had disappeared. The tenderness and œdema over the right mastoid pointed to trouble on that side. The mastoid antrum and cells were therefore explored, but nothing abnormal was found. The cranial cavity was next opened, and as the dura bulged and the pulsations of the brain were not felt, the cranial cavity, and subsequently the temporo-sphenoidal lobe of the brain were explored, a hydrocele trocar and cannula being passed in various directions into the brain. Although nothing was found, the patient's condition was much improved for a few days, apparently by relieving the intracranial pressure. On the eighth day after the operation, as the temperature still remained raised and the pulse continued slow (54), and the patient had again become delirious and noisy, and had developed some slight facial paralysis on the right side, a consultation was held, and it was decided that the old wound should be explored anew, and if nothing was found here, that the condition of the left temporo-sphenoidal lobe should be investigated, and afterwards the cerebellum. This was accordingly done, and an ounce of pus let out from the temporo-sphenoidal lobe on the left side. The wound was treated as in the former case, and the patient wonderfully improved for three weeks. He was considered to be practically convalescent, but suddenly, without any warning symptoms, became comatose, with a rapid pulse and high temperature, and died three days later. At the post-mortem examination a small collection of pus, amounting to rather over a drachm, was found in the left temporo-sphenoidal lobe. His cerebrum around was softened, apparently as the result of encephalitis. There was no meningitis.

Case 3.—A boy aged 18 years (No. 1932 Kenton) was admitted with a compound depressed fracture of the right parietal bone. He had received a blow on the head with a bar of iron one week previously. He was conscious, but very weak. He had no paralysis. Temperature 103°, pulse 84. There were two punctured wounds on the scalp, one of which was freely suppurating. Through an oval incision including the punctured wound a depressed fracture was discovered, and with the aid of the trephine and rongeur forceps the depressed bone was removed. As the dura mater bulged and did not pulsate, it was incised, but no blood was discovered beneath it. The inflamed tissue having been carefully cut away, the flap, after having been disinfected, was replaced and an ice-bag applied to the head.

The wound healed by the first intention and the patient rapidly recovered.

Case 4.—A man aged 37 (No. 1922 Kenton) was admitted in an unconscious condition. He had been knocked down by a cab the day before, the wheel being said to have passed over his neck. As he was very drunk, his stomach was washed out in the Surgery. He soon became noisy and delirious, and eventually drowsy, and paresis of the left side of the face, left arm, and to a less extent of the left leg came on. During the night he had a fit lasting thirty seconds, followed by general twitchings, and afterwards a complete paralysis of the left face and left arm, and increasing weakness of the left leg. At 12.30 P.M. he was trephined over the motor area on the right side. There was no blood superficial to the dura, but on this being incised a large quantity escaped. The patient slowly regained consciousness, and in two weeks the paralysis had disappeared and the temperature fallen to normal. From this time he gradually recovered and left the Hospital quite well. The wound healed by primary intention.

Case 5.—A man aged 66 (No. 1931 Kenton) was admitted unconscious, having fallen off a ladder. There was a large bruise over the left parietal bone, inter-condyloid fracture of the right femur, and a compound dislocation of the thumb. The patient, who had had a lucid interval after the accident, was becoming more deeply comatose, and had continued supination and pronation of the upper limbs, and rotation of the uninjured left lower limb. On trephining, a fissured fracture of the left parietal bone was found, and a large clot between the bone and dura mater. When this was turned out, the posterior branch of the middle meningeal, from which the blood came, was ligatured. The brain appeared completely pulped, and he died in six hours without recovering consciousness.

Case 6.—A lad aged 19 (No. 1596 Kenton) had influenza seven weeks previously, for which he was confined to his bed for three weeks, when a swelling began over the nose, and gradually extended over the forehead and towards the left eye, which became closed. The swelling had been lanced in two places outside the Hospital. It was now again freely incised, and a quantity of pus escaped, portions of the outer and inner table of the skull, which had necrosed, were removed, and pus was let out from between the bone and dura mater. The wound was plugged with iodoform gauze, and gradually but completely healed.

Case 7.—An infant eight months old (No. 1228 Lawrence) was trephined for chronic hydrocephalus. A semilunar flap

was turned down from over the parietal region, and beneath this a similar but smaller flap of the half-formed bone was raised and the dural cavity opened. A trocar and canula was next passed into the right lateral ventricle, and about an ounce of clear cerebro-spinal fluid oozed out. Two pieces of catgut were then passed down the canula into the ventricle, the canula removed, and the catgut left *in situ* for the purpose of establishing a drain between the distended ventricle and the subarachnoid space. The dura was stitched up with fine silk, the flap of bone replaced, and the wound closed. During the night the patient vomited and had four fits; the temperature rose to 102.6°. By the ninth day the wound had completely healed without suppuration; the temperature had gradually fallen to normal; the child had no more fits, and appeared to take an interest in its surroundings. It was discharged at the request of its mother apparently convalescent, but one month later it died at home of convulsions.

OPERATIONS ON THE NOSE, THROAT, TONGUE, AND MOUTH.

OPERATIONS FOR DEFLECTED SEPTUM.—Two operations were performed on patients aged fourteen and twenty respectively (Nos. 1138 and 942 Kenton). In neither was there any history of an injury, but the nose in one was crooked and projected to the left side. In one case the prominent portion of the septum was removed by Bosworth's saw, the remainder being forcibly straightened with the septal forceps. A rubber tube was inserted on the previously obstructed side and retained till the wound had healed and the septum had become consolidated in the central position. The other patient had been previously operated on at a provincial hospital, but he could not now breathe at all through the left nostril and suffered from severe frontal headaches. The septum was broken into several fragments with the septal forceps and then kept in position by a rubber tube. He left the Hospital breathing freely through both nostrils.

Though a small operation, the correction of a deviated septum is one that involves some little trouble. If too little is done, a relapse is almost sure to occur from the septum again resuming its faulty position; whereas, on the other hand, if the treatment is too vigorous, a perforation may result. All cases, however, cannot be successfully treated in the same way. Where a

somewhat thick projection of bone is the cause of the obstruction, as in the first case, nothing answers better than Bosworth's saw; whereas in the thin resilient septum, in which the bulging portion consists entirely of cartilage, the projection must be so broken up by the nasal forceps as to allow the fragments to overlap, or incisions must be made in various directions without penetrating the opposite mucous membrane to enable this sliding of the fragments on each other to be accomplished.

REMOVAL OF ADENOIDS AND TONSILS.—This operation was performed on seven patients. The tonsils were removed in each case with a French guillotine and the adenoids with a modified Lowenberg's forceps, Meyer's ring-knife, and Gottstein's curette. Nothing eventful occurred. One patient had also a deflected septum, which was straightened at the same sitting, and one patient had been previously operated on eighteen months ago, but the adenoids had returned or had not been thoroughly removed. All the patients were kept in bed for a few days after the operation, a precaution which is very essential if after-complications are to be avoided.

OPERATIONS FOR HARE-LIP AND CLEFT PALATE.—Two operations for hare-lip and three for closure of a cleft of the palate were performed.

The children with hare-lip were aged three and five months respectively (No. 770 Lawrence). In one of the cases, before uniting the hare-lip, the pre-maxilla, which projected, was forced back into position after having been partially separated from the maxilla with cutting forceps with one blade protected with strapping plaster.

The cleft palate occurred in patients aged three, five, and six respectively (Nos. 1304, 777 Lawrence and 1969 Kenton). Smith's operation in each case was performed, but the lateral incisions were made before the edges of the cleft were pared, and enlarged slightly afterwards. The sutures used were silver wire, horse-hair, and fishing-gut. Two united completely; in one the cleft partly separated.

The advantage of making the lateral incision before paring the cleft lies in the fact that there is only one bleeding instead of two, the paring of the edges of the cleft being practically bloodless after the lateral incisions have been made; whereas when the paring is done first, there is not only a free bleeding of the raw surface, but a second bleeding when the lateral incisions are made. All the cleft palate operations were performed with the head and shoulders raised on a pillow.

Much has been written on the advantages of the hanging head position in this operation. I have tried it recently, and, in my opinion, it cannot be compared with the raised position.

REMOVAL OF EPITHELIOMATA FROM THE TONGUE, INSIDE OF CHEEK, AND LOWER LIP.—Six operations were performed for the removal of epitheliomata from the tongue, inside of the cheek, and lip. All five occurred in elderly men. All the patients recovered. Enlarged glands in the neck were removed at the same time. Of the two cases of epithelioma of the tongue, only one half of the tongue was removed, but the glands on the affected side of the neck were completely dissected out.

In one case (No. 1436 Kenton) the left half of the tongue, with the floor of the mouth and the enlarged cervical glands, were removed by Kocher's method. The wound was packed with iodoform gauze and healed quickly and well, but the patient, who was sixty-two years of age, developed a slight septic pneumonia, from which, however, he slowly recovered.

In the second case (No. 1080 Kenton) the left side of the tongue was removed locally with scissors, and the glands in the neck were dissected out through separate incisions, which healed by the first intention. The patient made a rapid recovery.

In the first case, notwithstanding the ligature of the lingual artery in the course of the operation, there was considerable hæmorrhage of a venous character which appeared to come from the lingual vein. In another case not operated upon during the six months included in this report, in which the lingual artery had been tied, troublesome hæmorrhage ensued from the backward flow of blood from the dilated lingual vein. This experience has led me to tie the lingual vein as well as the lingual artery, where the latter operation has been deemed expedient as a preliminary to removal of the tongue. I found it (the venous bleeding) more troublesome to arrest than any arterial hæmorrhage from the lingual artery that I have had to deal with.

The removal of the tongue was limited to one half, because in my experience I have rarely if ever seen a recurrence in the other half where the disease, at the time of operation, has been limited to one side; but the floor of the mouth and the glands of the neck were thoroughly removed, since it is here that the disease only too frequently and rapidly recurs. The remaining cases presented nothing of special interest.

A FIBROMA OF THE CHEEK in a girl aged 10 years (No. 1333

Lawrence) was removed by an incision through the mucous membrane, thus avoiding an external scar. The wound, as is usual in mouth-wounds, healed rapidly without any septic trouble.

EXCISIONS OF THE BREAST.

Excision of the breast was performed five times. In each instance the whole breast, together with the contents of the axilla, was removed in one piece, so as to ensure the eradication of the lymphatics proceeding from the breast to the axillary glands. The breast having been dissected off, the pectoralis major, together with the pectoral fascia, was allowed to hang from its axillary attachment. The pectoralis major was next divided where necessary, the axillary vein exposed, and the fatty tissue of the axilla with the enlarged glands dissected off and removed with the breast as one piece. In one case a large portion of the pectoralis major was removed. As a rule, although a large amount of skin was taken away, the edges of the wound were brought into contact by freeing the lower flap widely from the latissimus dorsi, but in one case it was only accomplished by making incisions of relief and transferring the integumental flaps. A drainage tube was used in all cases, and in two was passed through an incision made in the lower flap in the most dependent part of the wound.

Two of the wounds healed by the first intention. In the others there was slight suppuration. This in one case was attributed to infection of the wound by the cancer which was fungating, and in the other case was unexplained.

The pectoralis major when divided was united by kangaroo-tail tendon. The patients were aged 45, 48, 63, 63, and 66. The microscope showed the tumours to be in all cases hard carcinomata.

ABDOMINAL OPERATIONS.

SUTURE OF THE STOMACH FOR PERFORATION DUE TO GASTRIC ULCER.—A married woman, aged 28 (No. 1496 Lawrence), was admitted on July 4 at 5.45 P.M. in a state of extreme collapse. She was cold and pulseless; the abdomen was rigid, fixed, and markedly tympanitic, and the liver dulness was effaced. She had suffered from pain after food for three weeks, and 19 hours before admission, about 1½ hours after her last meal, had been taken with sudden pain in the abdomen, which increased until she was brought to the Hospital. At 6.18 P.M. the abdomen was opened above the umbilicus in the middle line. The peri-

toneum was found extensively inflamed, and its cavity full of gas, fluid, and partly digested food. After some of this had been cleared away, a perforation one inch long was discovered in the anterior wall of the stomach, and was securely closed by six Lembert sutures of fine silk. Two incisions were then made in each flank, and through each of these a large drainage tube was passed. The abdomen, after having been thoroughly irrigated with warm boracic fluid, was closed, a third tube being left in the wound. The patient gradually sank and died the same night.

In this case twenty-four hours had elapsed since the rupture had taken place, and the peritoneal cavity had become filled with gas, medicines, castor-oil, and all kinds of undigested food, amongst which several orange-pips were found. Some of these pips had even made their way into Douglas's pouch and the renal recesses. Peritonitis had already commenced, and, notwithstanding thorough flushing and free drainage, terminated fatally. The ulcer, which was the size of a Tangerine orange, was not cut away, as it was felt that by doing so the operation would be considerably prolonged, and the patient was already in a state of extreme collapse; nor did it appear to be necessary. In a case I operated on some two years ago, where the perforation had only occurred a few hours before the abdomen was opened, the ulcer was also of considerable size, and an uninterrupted recovery followed the simple suture. In this case there was hardly any extravasation, and beyond the local cleansing of the soiled portion of the peritoneum with sponges, neither flushing or drainage appeared necessary, nor were employed.

The importance of immediate operation after perforation has occurred cannot be too strongly insisted upon. To wait for the patient to recover from the shock, as advised by some, is probably a mistake, since the shock, in some cases at any rate, would appear to be due to the escape of gas into the peritoneal cavity, and not to the extravasation of the contents of the viscus, and will pass off when the gas is let out. In a case of ruptured bladder under my care at the Metropolitan Hospital the effect of the introduction of free gas into the peritoneal cavity was most marked. On pumping a few ounces of air into the bladder to test its condition, the patient became intensely collapsed, as the air passed through the rent into the peritoneal cavity, but he at once improved on the escape of gas through the incision into the peritoneum. Here it was clearly the gas that produced the shock and not the contents of the viscus, and it would seem to be so likewise in the case of rupture of the stomach and of the intestine. In a case of the latter injury, in

which the bowel was partly torn across, there was very slight collapse, but only a very little air had passed into the peritoneum, consequent upon the ends of the ruptured bowel being plugged with solid fæces. Indeed, so little air had escaped, that the liver dulness was not effaced, nor was the abdomen tympanitic. The mere escape of fæces here had produced very little shock.

PYLORECTOMY COMBINED WITH GASTRO-ENTERECTOMY was performed in a man aged 29 (No. 78 Kenton) for carcinoma of the pylorus. Through a median incision the peritoneal cavity was opened and the pyloric end of the stomach and first part of the duodenum cleared of their mesenteric attachments and all bleeding vessels tied. A clamp was then placed on the stomach and duodenum well beyond the growth and the latter removed. The open ends of the stomach and duodenum were next closed securely with continuous sutures and the jejunum fixed to the stomach with a Murphy's button. The operation presented no difficulties and was rapidly completed, but there was some little trouble from venous hæmorrhage at the back of the duodenum. This having been apparently arrested, the external wound was closed. A vein, however, behind the duodenum evidently escaped ligature or the ligature slipped, for the collapse continued, and the patient died the evening of the operation. At the post-mortem examination some hæmorrhage had taken place into the peritoneal cavity, and this no doubt increased the shock, and was the determining factor of the fatal result.

EXPLORATION OF THE ABDOMEN was undertaken in two cases to ascertain the nature of a doubtful abdominal swelling, and whether it was removable. Neither patient suffered from the exploration.

Case I.—A man aged 21 (No. 1535 Harley) was admitted with a tumour situated between the umbilicus and the pubes, apparently fixed to the latter. It was three or four inches broad, and about the size of a large cocoa-nut. His bowels acted naturally, and there had been no blood in his motions, no pain on defæcation, and nothing abnormal was discovered in his urine or in the act of urination. The tumour could be felt per rectum as a rounded mass which could be moved by the finger. He had been losing flesh lately. A small incision in the linea alba was made and the tumour found to be fixed to the pelvis below and its attachments such as to render removal impracticable. It was covered with large tortuous veins, was of a dark red colour, and had the consistency of a soft solid. The wound

was closed, it united by primary adhesion, and the patient made an uneventful recovery from the exploratory incision. He was discharged with the tumour apparently *in statu quo*, perhaps slightly larger. He came to the Hospital three months later, having gained a stone and a half in weight, and the tumour had almost disappeared.

Case 2.—A woman aged 44 (No. 1340 Lawrence) was admitted for a swelling to the left of the middle line, and apparently connected with the stomach. She had had pain in her epigastrium, attended with vomiting and pain after taking food, for six months. She was believed to have carcinoma of the pylorus. An exploratory operation was deemed advisable to ascertain the practicability of removal. The exploratory incision revealed very extensive carcinomatous growth of the pylorus and pyloric end of the stomach, also a number of very large lymphatic glands in the gastro-hepatic omentum. The case was clearly unsuitable for pylorotomy; the wound was closed, and the question of removal of the whole stomach laid before the patient. She refused the operation, gradually got weaker, and died twelve days after the exploratory operation. At the post-mortem the carcinomatous growth was found to be very extensive, and had led to perforation of the walls of the stomach and the formation of a large sub-phrenic abscess.

The first case is of great interest as bearing upon the question of the occasional spontaneous disappearance of sarcomatous growths. It is of course possible that we were mistaken in our diagnosis, and that the tumour was not sarcomatous. Its rapid growth, firm connection with the pelvic bones, the progressive loss of weight and strength of the patient, taken with the appearance and the consistency of the swelling itself as revealed at the exploratory operation, led me to entertain no doubt as to its nature, and those of my colleagues who saw it with me were of the same opinion. This is the second case which I have personally met with of a supposed sarcoma in the abdomen disappearing spontaneously, and several of my colleagues have had, I know, a similar experience. It may be added that there was no discharge of pus from the rectum, bladder, &c., nor any other sign of its having been an abscess or of an inflammatory nature; but of course one cannot lose sight of the possibility that it might have been an inflammatory or some other affection of the glands.

ABDOMINAL SECTION FOR RUPTURE OF THE SMALL INTESTINE.—A lad aged 13 (No. 1811 Surgery and Harley) was admitted at 8.40 P.M., having been run over by a post-office van. He was

somewhat pale but not much collapsed. Temperature normal. Pulse, 78, small. There was a mark as of a wheel across his abdomen, which was slightly retracted but moved feebly on respiration. The liver dulness was not effaced. He had great pain in the back. At 11 P.M. he vomited twice; his abdomen now became hard, board-like, and markedly retracted, and pain had greatly increased in intensity. The pulse had run up to 100. The urine was drawn off and found normal. On opening the abdomen, a coil of intestine was found torn three-fourths across, but not involving the mesenteric attachments. Its ends were plugged with soft faecal matter. It was brought outside the abdominal wound and disinfected. Its mucous membrane was then united by five silk sutures, and the peritoneal and muscular coat by twelve Lembert sutures. The abdomen at the seat of rupture only was flushed out with hot water till the fluid ran clear. The gut was then returned and the external wound closed. He was kept under the influence of morphia for five days, and then had a dose of castor-oil. He was fed at first entirely by the rectum. The wound was dressed on the twelfth day, and found dry and healed. On the fourteenth day he first passed a formed motion, and began to take solid food. He left the Hospital in excellent health on the forty-second day after the injury.

It was at first thought that the case was merely one of abdominal shock, but as the diagnosis was at the best doubtful, I determined to wait in the Hospital and watch him. After the vomiting at 11 P.M. the abdomen became so rigid, board-like in hardness and retracted, and the pain so increased in severity, that I had no hesitation in opening the abdomen. The early interference no doubt had much to do with his recovery. The absence of marked shock or of tympanitis, and the effacement of the liver dulness, which are considered signs of rupture of the intestine, are attributable to the plugging of the ruptured ends with faecal matter.

INTESTINAL OBSTRUCTION.—Only one case was admitted during the six months. It occurred in a woman aged 65 years (No. 650 Lawrence). For two months she had had frequent attacks of vomiting and constipation, and had been losing flesh. Her bowels had not been opened for fourteen days before admission. The abdomen was greatly distended and she was vomiting faecal matter. Nothing could be felt through the distended abdominal parietes, nor by the rectum or vagina. Inguinal colotomy was performed on the left side. A Paul's tube was placed in the distended sigmoid, and the bowel secured to the wound. The

patient's condition was such that no exploration of the abdominal cavity with the finger was permissible. She was at once relieved, and progressed in every way satisfactorily. Five days afterwards, on passing the finger into the colotomy wound, an obstruction was encountered about three inches down the distal portion of the gut, and after her condition had further improved the abdomen was opened below the colotomy wound by a small incision, the loop of intestine containing the growth drawn out, the growth excised and the intestine united end to end with a Murphy's button. The abdominal wound was then closed. Twelve days subsequently the button was removed per rectum, into which it had fallen, but had been there retained by the sphincters. Injections could now be passed freely from the anus through the colotomy wound and *vice versa*, and no contraction could be felt with the finger passed through the colotomy wound. Two months after an attempt was made to close the colotomy wound by separating the mucous membrane from the skin and uniting it by fine silk sutures; the edges of the external wound having been pared, were then united. The union, however, partially broke down and some faeces continued to escape through the old colotomy wound. In this condition she was discharged. Another attempt to close the colotomy wound is contemplated shortly. A microscopical examination of the growth showed it to be a cylindrical-celled carcinoma.

OPERATIONS FOR APPENDICITIS.—Two patients were admitted with appendicitis. One, a man aged 24 (No. 2132 Kenton), had had recurring attacks at frequent intervals since 1892. On admission he complained of localised pain in the right iliac fossa beneath M'Burney's point, but nothing abnormal could be felt. His pulse, temperature, and general condition were normal. An incision was made in the right iliac fossa over the appendix. After some search the appendix was discovered tightly bound down by adhesions and containing a faecal concretion the size of a small marble; at this spot the walls had ulcerated, leading to a small perforation. The concretion, which was situated close to the entrance of the appendix into the caecum, was removed, and the opening into the gut closed by Lembert sutures of fine silk. The remainder of the appendix was so matted to the surrounding tissues, especially to the external iliac artery and vein, that the whole of it could not be removed. The remaining portion was therefore disinfected and ligatured, and the abdominal wound then closed, the peritoneal, muscular, and aponeurotic layers being united each to each respectively by silk sutures, and the skin with fishing-gut.

The skin sutures were removed on the eighth day. Some very slight superficial suppuration had occurred, but was confined to the skin edges. The patient left the Hospital on the 32nd day with the wound soundly healed and in good health.

The second patient, a man aged 25 (No. 1373 Kenton), had signs of subacute appendicitis, and had suffered from a similar attack two years ago. He had some pain in the right iliac fossa, but beyond a slight increase in resistance nothing definite could be felt, and manipulation caused him hardly any pain. His symptoms gradually subsided and he appeared to be recovering from his attack, but sixteen days after his admission his temperature suddenly ran up to 102° , and a slight swelling appeared about $1\frac{1}{2}$ inch internal to the anterior superior iliac spine on the right side. Over this an incision was made, and, without opening the general peritoneal cavity, three-quarters of an ounce of pus was let out. A tube was inserted into the abscess cavity, but no attempt was made to find the appendix, nor was the finger introduced or any washing out of the cavity done. From this time he made an uninterrupted recovery, and left the Hospital with the wound soundly healed. This last case is a good example of the wisdom, when pus is discovered, of not disturbing in any way the adhesions shutting off the abscess cavity from the general peritoneum. Where the surgeon has been content with merely opening such a localised collection of pus without searching for the appendix or exploring with the finger or washing out, I know of no case that has not, as in this, had a satisfactory ending.

In the first case a portion of the appendix was left. It is a question if this is not better practice, where dense adhesions exist, than running the risk of bruising and otherwise injuring the tissues, opening the bowel, &c., in a prolonged dissection to remove the whole of the adherent organ. In two other cases under my care, where part of the appendix could not be readily removed, the adherent part was also left after being disinfected. No untoward symptom of any kind followed, though some years have now elapsed since the operation. It appears probable that when cut off from the intestine the remnant of the appendix shrinks, undergoes fibroid change, and is quite inert. Theoretically there would seem to be some risk of an abscess, but I have not met with it in practice. At the same time, where the whole appendix can be removed with a reasonable amount of dissection, it is no doubt desirable.

EVACUATION OF ABSCESS OF THE LIVER.—An hepatic abscess complicated by a right-sided localised empyema was treated by resection of a rib and drainage. The patient, a Polish Jew, aged 37 years (No. 1718 Kenton), was transferred from Dr.

Brunton's ward. Twelve weeks previously he had been seized with violent pain in the region of the liver, and the pain had continued and increased in severity. Three years ago he had a similar attack, for which he had been treated at the London Hospital. The liver dulness was abnormally increased, and there was much tenderness over that region. There was no jaundice. An aspirator needle was passed between the 9th and 10th ribs, and a dark red fluid drawn off. It was found to contain blood, oil-globules, fat, and crystals, but no micro-organisms or hydatid hooklets. The ninth rib on the right side was resected in the mid-axillary line, and a large trocar and canula inserted in the liver. Two pints of dark-red purulent fluid were drawn off from the liver abscess, and subsequently a small quantity of a greenish fluid from a localised cavity in the pleura. A large rubber tube was now placed in the cavity in the liver, and a second in the cavity in the pleura. At midnight there was a violent hæmorrhage for a few minutes from the liver, which was controlled by packing. The patient improved at first, but although a very free drain was kept up, the discharge of the same purulent red fluid continued in very large quantities, and notwithstanding local injections of many kinds, and the employment of various internal hæmostatics, the patient gradually grew weaker, and died of exhaustion two months after the operation.

This is the third case under my care during the last few years that has run a similar course. In each great improvement followed the opening of the abscess, but the discharge continued in large quantities, the liver appearing to melt, as it were, away. In one of the cases which was under the care of Dr. Church a post-mortem was obtained, and the liver was found to be one huge abscess, little or nothing of the liver substance remaining. In the other two no post-mortem was allowed, but I have no doubt, from the fearful amount of the discharge, that a similar condition would have been found.

REMOVAL OF GALL-STONES FROM THE CYSTIC DUCT.—A woman aged 49 years (No. 1161 Lawrence) had suffered for six months from attacks of gall-stone, colic, vomiting, and jaundice. Nothing could be felt externally, but there was slight jaundice, some tympanitic distension of the abdomen, and some pain on pressure over the region of the gall-bladder. The urine contained bile. The temperature was normal. A vertical incision was made over the gall-bladder, and stones discovered in the cystic duct at its junction with the common duct. The stones were readily manipulated into the gall-bladder, but the latter

was so contracted that it could not be brought to the surface. An incision was made through its walls, four stones were removed, and the incision united by sutures. The external wound was then closed. The patient died of collapse thirty hours after the operation. No post-mortem was permitted.

EXPLORATION OF THE KIDNEY.—Three operations were performed for exploration of the kidney for stone.

Two of the cases were of precisely similar nature (Kenton 1299, Harley 80). In both cases the patients were men who were incapacitated from work by recurring attacks of pain answering in all respects to renal colic, in the one case in the right loin, and in the other in the left. In neither case was there anything to be felt, or anything abnormal in the urine, nor had either patient at any time passed blood. The kidney was exposed through an oblique incision between the last rib and the iliac crest, and examined by needling and manipulating with the finger. Nothing was detected. The wounds were closed and drained for forty-eight hours. They healed by the first intention. Both patients expressed themselves as being quite free from pain since the operation.

The third case was that of a woman aged 34 (No. 571 Lawrence), who had suffered from hæmaturia and gravel for ten years, and pain chiefly in the left loin. No tubercle bacilli were found in the urine, but large quantities of phosphates. With the cystoscope and finger introduced into the bladder, its walls were found pulpy and abnormally vascular and incrustated with phosphates. The left kidney was explored through the oblique incision, from the last rib to the iliac crest, and except that it was abnormally movable nothing was found. The kidney was fixed in position by four silk sutures. The wound suppurated slightly. The patient was discharged professing herself better. The improvement noted in the condition of the urine was probably the result of washing out the bladder.

OVARIOTOMY was performed three times. Two of the patients, aged respectively 24 (No. 931 Lawrence) and 35 (No. 852 Lawrence), made an uninterrupted recovery. The third patient, 38 (No. 1419 Lawrence), suffered from a broad ligament cyst, for which enucleation and a Keith's drain were employed. The patient died on the fourth day. The right kidney was reduced to a large abscess cavity, the result of an old pyonephrosis, and there was some localised peritonitis.

The operations were performed in the common theatre, and the patients nursed in the general ward. The condition of the

left kidney, which was undiscovered previous to the operation, had no doubt much to do with the fatal termination in the third case. The ovarian cyst was a very large one, and it was hence impossible to make out the enlarged condition of the kidney.

EXPLORATION OF SINUS FOLLOWING ABDOMINAL SECTION FOR EXTRA-UTERINE FETATION.—A woman aged 34 (Casualty, 935) had had the above operation performed in March 1896 at Leeds. The wound healed, but subsequently an abscess formed in its site, and opened spontaneously, leaving a sinus. The sinus was slit up and found to lead through the scar tissue for about two inches into the peritoneal cavity. The walls of the sinus were scraped and the cavity packed with iodoform gauze, the greater part of the skin incision being closed with sutures. The wound healed well, and the patient was discharged cured on the twenty-fifth day.

This operation practically amounted to an abdominal section.

RADICAL CURE OF HERNIA.

Excluding the cases in which a radical cure was performed after relief of strangulation, there were eight operations.

Five of the patients were men, three women. The hernia was inguinal in five cases, femoral in one, umbilical in one, and ventral in one. For the inguinal, Kocher's operation was performed three times; in the other two, the hernial sac was ligatured as high as possible, cut off, and the ligatures carried well up the inguinal canal with long needles passed through the aponeurosis about a quarter of an inch apart, and tied so as to fix the stump of the sac well above the internal ring. Kangaroo-tail tendon was used. The pillars of the ring were also drawn together by this material.

All the wounds healed by the first intention excepting in one case, in a man aged 61 (No. 1047 Kenton), in which the sac had a small pouch in its wall containing a drachm of chronic inflammatory fluid. He developed a severe bronchitis, for which he had to sit up in bed. Slight suppuration ensued, but in fifteen days after the operation the wound had soundly healed. All the patients left the Hospital with the wounds sound, with no impulse to be felt on coughing.

In the femoral hernia the sac was ligatured as high up as possible and cut away, but no attempt was made to close the femoral ring. The wound healed without incident.

In the umbilical hernia a large mass of omentum was transfixed and cut off. The peritoneum was then sutured, the ring refreshed, and closed with kangaroo-tail tendon, and the skin united by fine silkworm-gut. Healing by the first intention resulted. The patient was discharged with a firm scar.

The ventral hernia had followed an operation for appendicitis some months previously, in which a large abscess had been opened and drained. The protusion at the seat of the old operation was about the size of a fist. An incision was made over the long axis of the protrusion, the hernia reduced, and an elliptical portion of the protruding peritoneum cut away, and the peritoneal edges drawn together by a continuous silk suture. The muscles, aponeurosis, and skin were next severally united by three layers of sutures. Primary union ensued and the patient was discharged. Two months later there was some slight bulging beneath the scar, and an abdominal belt was ordered.

None of the patients were allowed to wear trusses after the operation.

I have now used kangaroo-tail tendon for some time for the ligature of the sac, the suture of the ring, and the fixation of the internal oblique and transversalis to Poupart's ligament in Bassini's operation. It has so far answered admirably. Silk I have found apt to set up irritation, and in several cases, some months after the operation wound had soundly healed, patients have returned with small localised abscesses, which, on being opened, have discharged the silk ligature. Catgut is not reliable. In a few cases, where Kocher's method has been employed, a hernia was found at the situation in the aponeurosis where the aperture was made for drawing the sac through. I do not know if this has occurred in the experience of others, but that it is liable to occur is, I think, a serious objection to Kocher's method.

Five cases of strangulated hernia were admitted. Two were femoral, three inguinal, one of the latter being double. Both cases of femoral hernia occurred in women, one aged 70, and one aged 42. The intestine was returned, the sac ligatured, cut off, and the wound closed. Recovery was uninterrupted.

In the inguinal herniæ, the result was not satisfactory. Two died, one recovered.

Case 1.—A man aged 58, an omnibus-driver (No. 2694 Kenton), had a double inguinal hernia, that on the right side being strangulated. On the left side the hernia was irreducible and about the size of an ostrich's egg. It was soft, gave an

impulse on coughing, and could be partially returned. The hernia on the right side came down three days before his admission with sudden pain, followed by vomiting and constipation. The vomit was feculent. An incision was made over the right hernia, the sac opened, the stricture, which was the internal ring, divided, the intestine returned and the neck of the sac ligatured with kangaroo-tail tendon, and the body of the sac cut off. The ring was also closed with kangaroo-tail tendon. The patient died early in the morning of the next day. At the post-mortem five feet of small intestine were found in the sac on the left side of the scrotum, but there was no obstruction or strangulation in connection with this or any other portion of the intestine. The coils of the intestine, however, were dark claret-coloured, as if from handling during the taxis. There was no peritonitis, but a few drachms of blood-stained fluid were found in the peritoneal cavity. The patient evidently died of collapse.

Case 2.—A man aged 67 (No. 1028 Kenton) had worn a truss for seven years continuously, but left it off about 3 P.M. on the afternoon of his admission to the Hospital, when the hernia came down and could not be reduced. At 10.15 P.M. herniotomy was performed. The sac contained about three drachms of a sanious fluid. The intestine was found matted together and of a dark red colour, and the tissues surrounding the sac were very cedematous. A small fatty tumour was dissected out from the constituents of the spermatic cord. The mouth of the sac was sutured with kangaroo-tail tendon, and the canal and ring sewn up with the same material. The skin was sutured continuously and a drainage tube inserted. On the following morning he vomited, but had no rise of temperature. On the second day the wound was dressed and the drainage tube removed. The patient had had a good night. From this time the pulse became irregular and the beat increased in frequency to 122. The temperature was 100° and the respirations very rapid. Some consolidation was detected at the root of the lungs. He died on the third day. At the post-mortem the wound was found quite healthy, and there was no peritonitis. Chloroform was used at the operation, but there was hypostatic congestion of both lungs.

Case 3.—A man aged 40 (No. 1362 Kenton), a brewer's labourer, had had a hernia for sixteen years and had worn a truss. The hernia became strangulated on the morning of his admission to the Hospital. The operation was at once performed. The intestine, which was already claret-coloured, was returned after division of the stricture at the internal ring, and the omentum

ligatured and cut off. There was some troublesome hæmorrhage on division of the stricture, but as it soon stopped spontaneously, no extensive search was made for any bleeding vessel. The sac was ligatured with kangaroo-tail tendon and cut away, the pillars of the ring drawn together with a like material, and the wound closed. On the ninth day the stitches were removed and the wound looked healthy, but the temperature registered 101.8°. On the following day the abdomen was tense and brawny about the wound, which three days later opened and discharged some foul breaking-down blood. Some bleeding had evidently occurred in the depths of the wound, which after this healed satisfactorily, and the patient left the Hospital with a firm scar.

RADICAL CURE OF HYDROCELE.

The patient, a lad aged 17 (No. 1919 Kenton), had been previously operated on for varicocele. The tunica vaginalis was laid open, the loose portion of the parietal layer cut away, and the edges brought together with fine silk sutures. The wound did not heal by the first intention, but gaped without suppuration, so the stitches were not removed till the seventeenth day. It slowly granulated up, and he was discharged well on the twenty-fifth day.

RADICAL CURE OF VARICOCELE.

Four operations were performed. In each case an open incision was made over the cord close to the external abdominal ring, the veins separated and tied in two places with a fine silk ligature about an inch apart, the intervening vein cut away, and the stumps ligatured together. The scrotal wound was closed by silkworm-gut sutures, and healing by the first intention ensued. The open operation was employed for the purpose of shortening the cord, since if this is not done the testicle still hangs somewhat low, and the patient, if a candidate for the Services, is, notwithstanding the obliteration of the veins, liable to rejection.

LIGATURE OF VARICOSE VEINS.

Seven operations for the radical cure of varicose veins were performed. All the patients made excellent recoveries. Their ages ranged from 16 to 42 years. Four were males, three were females. Both legs were affected in two, the left

leg alone in four, the right alone in one. In the last mentioned case there was a varicose ulcer and considerable varicose eczema.

In three of the cases the dilated veins were exposed at previously selected spots through a short incision ($\frac{3}{4}$ inch), tied in two places with fine silk, the intervening portion of vein cut away, and the wounds closed with fine catgut sutures. In the other five no ligature or suture was used. The vein was exposed, clamped with two pairs of pressure forceps, and the intervening vein cut away, the forceps being left in until the varicose veins at the various selected spots had been thus treated. The foot and leg was then bandaged from below upwards with carbolic gauze bandages soaked in corrosive sublimate solution (1 in 2000), the forceps being removed as the bandage approached each little wound, but no ligature was applied. Care was taken to ensure the edges of the wounds coming accurately in contact as the bandage was wound on. The ordinary double cyanide dressing was then applied.

The advantage of the method is the great saving of time that is effected when the veins have to be obliterated in many places. As regards the healing of the wound, there does not appear to be much to choose between the operation with ligatures and sutures and the one without, except perhaps they show less tendency to gape. In all the cases healing by the first intention ensued, except in the case which was complicated by the eczematous ulcer. Although an effort was made in this case to render the eczematous skin aseptic, some infection of the wound near the ulcer occurred, and healing was delayed for a few days.

OPERATIONS ON JOINTS.

EXCISION OF JOINTS.—An excision of the elbow and an excision of the knee were performed, each for tuberculous disease.

Case 1.—A girl aged 7 years (No. 1073 Lawrence) had her elbow fixed at a right angle. The joint was much swollen, the skin ulcerated on the outer side, and the epitrochlear gland enlarged. The olecranon was removed and the pulpy synovial membrane scraped away; but the superior radio-ulnar articular, which appeared healthy, was undisturbed. The joint was filled with iodoform emulsion, the wound closed, and the limb placed on a Callender's splint. An abscess, however, formed on the inner side of the joint, and had to be opened. The patient left the

Hospital with a sinus still discharging. It would no doubt have been better to have completely excised the joint, instead of being content with what was practically merely an erasion.

Case 2.—A boy aged 9 (No. 1049 Kenton) had suffered with a tuberculous knee for fifteen months. An incision was made across the middle of the patella horizontally, the bone then sawn through, and the joint laid freely open. The synovial membrane, which was pulpy and injected, was completely removed with scissors and a sharp spoon. The articular cartilages and such bone as was found diseased was treated in a similar manner. A superficial abscess at the inner side of the head of the tibia was evacuated and scraped. The crucial ligaments, being healthy, were not touched, but the external semilunar cartilage, which was diseased, was removed. The patella was united with silver wire after the wound had been thoroughly disinfected by corrosive sublimate lotion (1 in 500). The leg was placed in a Macintyre splint. The wound healed by the first intention. The knee was put in plaster of Paris, and the patient discharged on crutches.

REMOVAL OF LOOSE CARTILAGES FROM THE KNEE.—The knee-joint was opened twice; in one case, a loose piece of cartilage was removed; in the other, a partially-detached internal semilunar cartilage was found folded on itself, and was also removed.

Case 1.—A man aged 55 (No. 2519 Kenton) had fractured his right patella twenty-five years ago, and had since suffered from signs of a loose body in his joint. The cartilage was removed through an incision over it at the upper and outer part of the joint. The synovial membrane was sutured with kangaroo-tail tendon, and the skin with silkworm-gut. The wound healed by the first intention. The patient was allowed to get up on the seventeenth day, and expressed himself as greatly delighted with the result. He was discharged cured on the twenty-seventh day after the operation. The loose cartilage was the size of a small walnut, and fissured in all directions—one fissure almost dividing it into two parts.

Case 2.—A man aged 25 (No. 1305 Kenton) eight months previously had received a blow on the outer side of the left knee at football. Almost immediately afterwards he felt something loose in his joint, and the knee became locked in a flexed position. He had been treated by firm bandaging, fixation in plaster of Paris, &c., without benefit. On opening the joint through a vertical incision on the inner side, the internal semilunar cartilage was found folded on itself. On flexing the joint it came

unfolded, but flew back again into the bent position on extension with a distinct snap. It was removed. The wound healed by the first intention, and the patient was discharged on the thirty-third day, with good movement in the joint and no pain.

WIRING OF FRACTURED PATELLA.—Three cases only of fractured patella were admitted during the six months. All three were wired, two by the open method, and one after the manner of Mr. Barker. In all, healing by the first intention ensued, and there was no constitutional disturbance. The open operation was practised on two patients, both males, aged 33 and 39 respectively (Nos. 1910, 1920, Kenton). It was performed by making a longitudinal incision between two and three inches long over the patella, removing the torn aponeurosis, which covered the fractured surface of the two fragments, cutting away all torn and lacerated tissues, sponging and washing out of the joint all blood clot, and then uniting the fragments by a single loop of stout silver wire. The hole for the wire was made with a sterilised Archimedean drill, and passed from the outer surface obliquely to near the lower margin of the fractured surface, so that the articular surface was not involved. The wire, when passed, was twisted up till the fragments were in close apposition, and the twisted portion of wire then hammered into the superficial surface of the patella, leaving the surface quite smooth. The wound was then washed out with 1 in 2000 biniodide of mercury solution, and closed with fishing-gut sutures. Healing by the first intention ensued in both cases. The stitches were removed about the ninth day. Passive movements and massage were begun on the nineteenth and twentieth days respectively after the wiring, and the patients allowed to get up and walk about. They were discharged, with free movement of the joint and no pain or lameness, on the thirty-third and thirty-eighth days after the wiring. The wiring was performed on the fourth and fifth day respectively after the accident.

The so-called subcutaneous method of Barker was employed upon a female aged 53 (No. 1569 Harley), and was performed four days after the accident. A small vertical incision (half inch) was made into the joint through the ligament at the lower border of the patella, and as much blood squeezed out of the joint as possible. Barker's curved needle was then passed up beneath the fragments, and brought out through the skin immediately above the upper margin of the upper fragment. It was threaded with silver wire, and withdrawn.

The free ends of the wire in the lower wound were then twisted, cut off short, and buried in the ligament. Healing by the first intention ensued. Massage and passive exercises were begun on the thirteenth day, and walking on the seventeenth day. The movements of the joint, though ultimately restored, were not obtained so quickly or so freely as after the open method, and some effusion occurred in the joint. She was discharged on the fortieth day after the operation.

When the strictest antiseptic precautions are taken, the result obtained by wiring a fractured patella cannot be compared with that of the non-operative treatment, and the length of stay in the Hospital is greatly reduced. The gain to the patient as regards his ability to resume his former occupation is immense, and, in place of leaving the Hospital even at the best with a somewhat weak and crippled knee, and encumbered with an instrument for limiting the movements of the joint which he may have to wear from six to twelve months, he is discharged within a month with a sound knee, in which the movements, if passive movements and exercises are begun early, are practically perfect.

AMPUTATIONS OF LIMBS.

Five cases of amputation were performed—one for tuberculous disease of the knee of five years' standing, two for a mixed-cell sarcoma of the lower end of the femur, and two for ununited fracture of the bones of the leg. All five cases healed by the first intention. Silk ligatures and fishing-gut sutures were employed. A drainage tube was placed in the wound in the three cases of amputation through the thigh, but the wound was completely closed without drainage in the two amputations through the leg. Two of the cases of amputation of the thigh were in men aged 64 and 66. They are examples of the excellent way in which wounds heal in elderly people.

The tuberculous knee occurred in a man aged 64 (No. 2568 Kenton), and is of interest in that it was clearly a case of senile tuberculosis. The history he gave was that about five years ago he first began to walk lame, and his lameness gradually became worse, so that seven months ago he had to give up his work. Rest, strapping, and fixation with plaster of Paris had all been tried, and had failed, before his admission. The knee presented the characteristic signs of a tuberculous joint, save that it was not tender either on manipulation or

movement. The joint was found after amputation to present the typical appearances of tuberculosis in an advanced stage. There were no other evidences of tuberculous trouble elsewhere.

The two operations for ununited fracture were of particular interest, because they were performed for that somewhat rare though well-recognised condition, the ununited fracture of children.

Case 1.—A boy aged 10 (No. 1342 Kenton). He had broken his leg two years ago and had been treated for it at St. Thomas's Hospital. It failed to unite, and the fragments had been wired without leading to union.

Although the bones at the seat of fracture were felt to be very atrophied, and the hopelessness of securing bony union in these cases of ununited fracture in children was borne in mind, it was resolved to make another attempt at securing consolidation before submitting the patient to amputation. On May 13th an incision was made three inches in length over the fracture and a wedge-shaped piece of bone removed from each fragment, so as to bring them into apposition. An aseptic carpenter's screw was then inserted and the two raw surfaces of bone firmly screwed together. In the course of the operation some wire used in the previous unsuccessful attempt was removed. The operation failed, and amputation was performed just above the fracture by lateral flaps on August 2nd. The bones were found at the seat of fracture to be exceedingly small and atrophied. On August 11th at the first dressing the wound was found united by the first intention.

Case 2.—A boy aged 8 (No. 1634 Harley). The leg had been broken at another Hospital some five years previously for a rickety curvature, and had never united. Since 1894 he had been under the care of Sir Thomas Smith and Mr. Walsham, and had been treated by absolute rest, fixation in plaster of Paris, splints, and other appliances, and two operations of wiring and of screwing the fragments together had been successively performed, but without the least effect. The leg was removed by antero-posterior flaps. Union by first intention ensued. The bones were exceedingly thinned and wasted, their ends tapering off into fibrous bands which stretched between the fragments.

The cause of this non-union in these so-called ununited fractures in children is hardly known, but those interested in the subject will find the matter ably discussed by Mr. D'Arcy Power in the *Medico-Chirurgical Transactions*, vol. lxxv., and by Mr. Edmund Owen in the *Proceedings of that Society*.

In one case the thyroid extract was given, but without effect.

The case of mixed sarcoma of the femur occurred in a man aged 66 years (No. 1026 Kenton). He was admitted with a swelling on the inner side of the right knee, which he had first noticed two months ago. He remembered no injury excepting a sprain followed by swelling of the knee six years ago. On the inner side of the internal condyle of the right femur was a hard well-defined swelling with a tender spot about the middle. It was clearly connected with the bone. The skin was not adherent. There was no egg-shell crackling. It was explored, having been found to be a mixed-celled sarcoma with a few myeloid cells. As it was too large for local treatment, the thigh was amputated through its middle by antero-posterior flaps. The bone at the point of division appeared quite healthy. The stitches were removed on the fourteenth day and the wound found firmly united.

The third case of amputation through the thigh was for a chondro-sarcoma in a woman aged 24 (No. 713 Lawrence). An exploratory incision was made and the growth shown to be a chondro-sarcoma. The thigh was amputated through the juncture of the upper and middle third. The wound healed by the first intention. No recurrence has as yet taken place.

OSTEOCLASIA.

Osteoclasia was performed four times, in each case Thomas's osteoclast being used. Two of the cases were for double genu valgum in children aged 5 and 7 (Nos. 917 Kenton and 737 Lawrence). The knock-knee was in both cases due to rickets. After the femora had been fractured the limbs were placed in a Hamilton's splint and a weight extension of four to five pounds applied. Nothing eventful occurred. Both children suffered as usual from pain in the abdomen and back for the first few days, but there was no pain to speak of at the seat of fracture. The bruising of the soft tissues, as is usual, quickly disappeared. Of the other two cases, one was for bowing of the bones of the leg due to achondroplasia. The girl, aged 15 (No. 786 Lawrence), was stunted in appearance and had the aspect of a child of ten. Ten years ago it was first noticed that her limbs were not growing in proportion to the trunk and her legs became bowed. Lately all the bones had become very thick and the bowing of the legs had increased. Her height was only three feet eleven. Her arms were short and thick and

the fingers thick and stumpy. The head was flattened from before backwards and increased in size laterally. She had two sisters who suffered from a similar condition. The tibia and fibula on each side were broken with the osteoclast, straightened, and put up in plaster of Paris. The fractures united readily and the patient was discharged greatly improved on the eleventh day after the operation.

The last case, a laundress aged 25 years (No. 826 Lawrence), was one of ankylosis of the right knee in a position of extreme valgus, the leg being at an angle of about 45° with the thigh. The whole limb was much wasted, and shortened a quarter of an inch. The right knee had been stiff since childhood; the wasting of the limb was the result of infantile paralysis. She was unable to walk without a crutch or stick. The right femur was broken in its lower third with the osteoclast and the limb put up in a Liston's splint with a weight extension of 6 lbs. The bone united firmly and she was discharged greatly improved. A deep slough separated on the inner side of the thigh, presumably caused by bruising from the osteoclast.

OPERATION FOR MALUNITED FRACTURES.

Four cases of malunited fracture, three about the ankle, were treated by wrenching under an anæsthetic, with the addition of division of the tendo Achillis in one case. All were greatly improved and left the Hospital walking well.

Case 1.—A woman aged 39 (No. 689 Lawrence) six months ago injured her foot mounting a bicycle. A sprain was diagnosed at first, later a fracture of the fibula, and the leg put up in plaster of Paris. Her ankle had been stiff since. On admission her ankle presented well-marked signs of Pott's fracture. The foot was wrenched, but no good movement could be obtained till the tendo Achillis was divided. Adhesions were then broken down and the foot placed in plaster in a good position. The result was excellent.

Case 2.—A woman aged 41 (No. 1071 Lawrence). She broke her left ankle twelve months ago and was in a hospital for six weeks. Since then the ankle has always been stiff and fixed in a semi-extended position. Good movement followed the wrenching.

Case 3.—A woman aged 64 (No. 811 Lawrence). Nine weeks ago she hurt her ankle, and has since been unable to move the joint or get about without a crutch. She was much improved with the wrenching and left the Hospital without a crutch.

Case 4.—A boy aged 10 (No. 2063 Kenton) had his elbow wrenched for a T-shaped fracture of the lower end of the humerus and separation of the olecranon. The position of the fragments was corrected as far as possible, and he left the Hospital much improved. A skiagram had revealed the exact condition of the parts.

EXCISION OF THE COCCYX.

Excision of the coccyx was undertaken in a woman aged 18 (No. 829 Lawrence) for long-continued coccydynia.

The affection was caused by a fall on her back, and was attended by the usual symptoms of pain on sitting and rising. An incision was made in the middle line over the coccyx, and the muscular and ligamentous connections having been severed, the bone was removed. It was found to have been fractured and ununited, but no crepitus was felt previous to the operation with a finger in the rectum and the thumb over the bone. She was completely relieved of her pain and disability.

In the performance of this operation care should be taken to keep the knife in close contact with the bone, so as to avoid the risk of injuring the rectum.

OPERATIONS ON THE URETHRA AND RECTUM.

The operations for perineal abscess and fistula *in ano* call for no comment. An internal urethrotomy was employed once for an obstinate stricture which could not be dilated beyond the size of a No. 5 catheter. Otis' urethrotome was used. No bad symptoms followed. The patient was discharged passing a No. 10 catheter for himself.

A case of multiple polypi of the rectum was transferred from the medical side. The patient was a boy aged 17 (No. 857 Rahere and Kenton), but having the appearance of a boy of 9. The condition of the rectum was almost identically similar to that described by Sir Thomas Smith in the Hospital Reports for 1887. But none of his relations were found to have ever suffered in the same way, as was the case in Sir Thomas Smith's patient, and in another patient who was under my care in the Hospital some year or so ago. The chief trouble was continuous and excessive diarrhoea. As many of the polypi were removed as possible, but a large number remained. The boy's condition improved wonderfully and the diarrhoea completely stopped. The danger of this condition is the liability of one or more of the polypi to become epitheliomatous as age advances. This

actually occurred in my patient above referred to, and in his sister who was under the care of Mr. Berry at the Royal Free Hospital. Another near relative of the patient was also said to have suffered from a similar condition, and to have ultimately died from cancer of the rectum.

OPERATIONS ON MUSCLES, TENDONS, AND FASCIÆ.

SUBCUTANEOUS DIVISION of the sterno-mastoid for wry-neck was performed on a girl aged 7 (No. 926 Lawrence). The wry-neck was of congenital origin, and the sterno-mastoid was much contracted. It was divided subcutaneously in four places. Through one puncture the sternal portion was severed; through a second, just outside the muscle, the clavicular portion was divided; and through two punctures in the region of the mastoid process the insertion of the muscle was cut through. The head was then over-corrected and maintained in this position by a bandage and sand-bags. On the thirtieth day she was allowed to get up, her parents instructed as to what exercises should be practised, and a poro-plastic cervical collar ordered to be worn for six months.

Over-extension after division of the sterno-mastoid for wry-neck is, I consider, an important point in the treatment. It considerably lessens the time that mechanical after-treatment may be required, even if it does not do away entirely with the need for any subsequent mechanical extension. In the case above reported the contraction was severe. Hence it appeared desirable to employ a light poro-plastic collar for some six months to prevent a relapse. Exercises which consist in forcibly moving the neck in various directions, whilst the patient resists the surgeon's efforts, should be practised to restore the muscular tone, not only in the divided sterno-mastoid, but also in other of the cervical muscles. It is well that the exercises should be begun some weeks before the tenotomy is performed, as in this way the after-treatment is further shortened.

Much has been written of late of the danger of subcutaneous puncture, and this method has been abandoned by some surgeons in favour of the open division. I have done both, but prefer the subcutaneous in that it leaves practically no scar, whereas after the open incision at the best a linear scar must be left, and sometimes even a considerable cicatrix which I have known become keloid. If the subcutaneous division is done, as it was in this case, by opening the sheath of the muscle, and then taking care as the director is passed beneath the muscle that it is kept between

the muscle and the posterior layer of the sheath, there appears to be little risk. The veins lie behind the sheath, and thus protected can hardly be injured. The chief risk, it need hardly be said, is a wound of a vein, followed by the entrance of air and sudden death, an accident which happened many years ago to a surgeon of this Hospital.

SHORTENING OF THE PERONEUS LONGUS FOR DISLOCATION OF ITS TENDON was performed on a woman aged 23 (No. 1613 Harley). Ten months ago she slipped and hurt her ankle. It was bandaged without effect, the tendon of the peroneus longus constantly slipping out of its groove on to the external malleolus and causing her great pain and lameness. An incision was made over the back of the external malleolus, the tendon exposed, half an inch removed, and the ends dovetailed together and united with fine silk sutures. The foot and ankle were then put up in plaster of Paris. Healing by the first intention was obtained, and the patient was discharged cured on the twenty-first day after the operation.

When the tendon is found, as in this case, distinctly elongated, a much better result is obtained by shortening the tendon than by attempting to form a new groove for it by turning down a flap from the periosteum covering the external malleolus. In a case treated in this way some eighteen months ago, the tendon after a few months again became displaced, dragging the new groove with it. Shortening the tendon, however, at a subsequent operation cured the condition, as in the present case.

THE PALMAR FASCIA was divided subcutaneously in one hand, and dissected out by open incision in the other, for Dupuytren's contraction in a man aged 50 (No. 1244 Kenton). Four subcutaneous punctures were made in the right hand, and the second and third fingers, which were contracted, released. An incision two and a half inches long was made over the third metacarpal bone in the right hand, and the contracted fascia dissected away. Opposite the fourth finger of this hand the fascia was divided by subcutaneous punctures. The result was excellent in both hands, and there appeared nothing to choose between the two operations. Immediate extension in each case was employed, and the hands fixed on a dorsal splint.

OPERATIONS FOR DEFORMITIES OF THE FEET
AND TOES.

ASTRAGALECTOMY was undertaken in a girl aged 4 years (No. 779 Lawrence) for relapsed talipes varus congenitalis of the left foot. Numerous tenotomies had been performed elsewhere, and Phelps' open incision had been practised at a Children's Hospital without any improvement. The astragalus was removed through Lund's incision, and some portions of the adjacent bones, namely, the os calcis and external malleolus, had to be excised to permit of complete rectification of the foot. Some slight suppuration occurred, but the wound healed steadily. Massage and passive movements were begun. She was discharged with the foot in a greatly improved position, and with fair movement at the ankle-joint. The case is of interest as another example of the ultimate failure of Phelps' open incision method to permanently rectify congenital varus. The bones not having been attacked, the scaphoid, as the wound contracted, had been gradually drawn again into its faulty position around the inwardly inclined head of the astragalus. On the removal of this bone the articular surface of the head was found to look almost directly inwards, as is commonly the case in this deformity.

SHORTENING OF THE TENDO ACHILIS was employed for elongation with resulting talipes calcaneus, following a tenotomy of the tendon for talipes equinus ten months previously, in a man aged 20 (No. 1338 Casualty). A Y-shaped incision was made over the tendon, as devised by Willett, the tendon divided, the ends shaved off obliquely, the upper retaining its skin connection, the lower its deep connections, untouched. The raw surfaces were then brought together and secured by four sutures passed through the skin and tendon. The skin wound at the end of the operation thus became V-shaped. The foot was put up in plaster of Paris in the extended position. Primary union ensued, and the patient was discharged cured.

EXCISION OF THE HEAD OF THE METATARSAL BONE OF THE GREAT TOE was employed for HALLUX VALGUS in a man aged 18 years (No. 1260 Kenton). The incision was made on the inner side, the enlarged bursa dissected out unopened, and the enlarged head of the metatarsal bone removed by bone forceps. The toe was then corrected, and the wound, which was completely closed, united by primary intention. Good movement

was obtained. The patient was discharged cured of his trouble.

This is an admirable operation if passive movement is begun early, and leaves the patient with a very useful joint. I have seen no trouble from the interference with one of the piers of the so-called plantar arch, and have obtained much better results than by the removal of the base of the first phalanx, which has been highly recommended as a substitute for excision of the head of the metatarsal. The danger of the arch sinking and the foot becoming flat is, I believe, theoretical rather than real.

I would emphasise the importance of removing the bursa, if possible, unopened. Where this precaution has been neglected I have known septic trouble to occur, and inflammation and suppuration spread through the sole of the foot, necessitating numerous incisions, and a stay in Hospital for upwards of three months.

OPERATIONS FOR HAMMER-TOES were performed twice. In one case, in which the second and third toes of the right foot were affected, an oval incision was made over the first inter-phalangeal joint; the heads of the first phalanx forced out of the wound and cut off. The corns and bursæ on the dorsal aspect of the joints were then dissected out, and the toes secured on a gutta-percha splint. The wounds healed by the first intention, and the patient left the Hospital with the deformity corrected, with good movement of the joints, and without pain.

Excision of the head of the first phalanx is perhaps the best operation for this troublesome affection, as it leaves a movable toe in the straight position, and is not followed by a relapse, as is so frequently the case after the subcutaneous division of the contracted ligaments. It is the operation *par excellence* for those who wish to enter the Services, amputation of the toe excluding the candidate.

DIVISION OF EXTENSOR TENDONS FOR CLAW-TOES was performed in a man aged 19 (No. 920 Kenton). All the toes of both feet were affected. The long extensor tendons of all the toes were divided subcutaneously, and the bursa removed from over the metatarso-phalangeal joint of each great toe. The toes were then extended and bandaged in that position on to a splint provided with slots.

REMOVAL OF TUMOURS.

Eight operations were performed for the removal of tumours in various parts of the body. They comprised a myeloid sarcoma of the head of the humerus, a nævus in the neighbourhood of the parotid gland, a bursal swelling over the head of the fibula, two prepatellar bursæ, an adenomatous growth in the thyroid gland, a cystic adeno-fibroma of the breast, and a growth in the perineum, probably due to filarious obstruction of the lymphatics.

The MYELOID SARCOMA occurred in a man aged 24 years (No. 1806 Kenton). The swelling had been noticed one year, and was said to follow a blow. It was situated in the head of the left humerus. It was removed locally, and was about the size of a cricket-ball. The circumflex nerve had to be divided during the operation, and at its conclusion was sutured. The deltoid, which had also to be incised in a vertical direction, was sutured with kangaroo-tail tendon. No drain was employed. Union ensued by the first intention. The movements of the shoulder-joint were excellent.

The NÆVUS occurred in the parotid gland of a child aged 5 months (No. 998 Lawrence). It was very difficult to remove on account of its intimate relation with the branches of the facial nerve and the acini of the gland. An abscess formed in the parotid in the course of healing, probably as the result of infection through the acini and ducts of the gland, which were unavoidably laid open during the operation. Some facial paralysis was noticed just after the operation, no doubt as the result of pressure on the nerve, but this had passed off when the patient was discharged.

The BURSAL SWELLING occurred in a man aged 53 years (No. 2053 Kenton), and was situated to the inner side of the head of the left fibula. It extended deeply amongst the anterior muscles down to the interosseous membrane. At the operation no communication could be made out with the knee-joint. The bursa was dissected out, and the wound healed by the first intention. Four years previously a similar swelling had been removed from the same situation.

TWO ENLARGED AND NEARLY SOLID PREPATELLAR BURSEÆ were removed through a vertical median incision in patients aged

20 and 23 respectively. The cases call for no comment. Both wounds healed by the first intention.

The ADENOMA of the thyroid occurred in a foundry-labourer aged 25 (No. 1690 Kenton), and had been noticed eight years. It was situated in the left lobe. An incision was made over the swelling through the attenuated thyroid down to the capsule of the growth, and the tumour, which was about the size of a walnut, enucleated without difficulty. The wound healed by first intention.

A CYSTIC ADENO-FIBROMA of the breast was dissected out from a woman aged 47 (No. 1427 Lawrence). The wound healed by the first intention. The case presented nothing of particular interest.

The PERINEAL TUMOUR occurred in a man aged 44 years (No. 1201 Harley), who had lived for the last twenty years in Demerara. In July 1896 he had had a small warty growth of five months' standing removed from the left side of the prepuce. It was subsequently twice removed at intervals of six months. In February 1898 the present condition began to appear and to gradually get worse.

On admission, the patient had incontinence of fæces. Numerous hard nodules were situated in the left corpus cavernosum and along the course of the dorsal vein, and a hard mass the size of an orange in the perineum. Per rectum, hard cord-like masses were felt running from the prostate up the pelvic wall. On one occasion filaria were found in his blood at night. On two occasions portions of the growth were scraped and other portions dissected away. The material was very like sebaceous matter. The wound healed well. The patient left improved in general health, but the local condition was much the same.

EXTIRPATION OF TUBERCULOUS GLANDS.

Extirpation of tuberculous glands in the neck was performed five times. In four of the cases suppuration had occurred, and in one caseation had begun. In one, a female aged 21 (No. 843 Lawrence), a sinus two inches deep extended to a mass of enlarged and breaking-down glands deeply seated under the sterno-mastoid. An incision was made around the sinus completely embracing the unhealthy skin, and the sinus with the

glands dissected cleanly away. The wound healed, leaving a mere linear scar, to the great improvement of the appearance of the patient's neck. In one case, a man (No. 982 Harley) with a huge mass of glands on both sides of the neck, extending from the jaw downwards into the carotid triangle, a long and tedious dissection was required, as suppuration had already begun, and adhesion to the surrounding tissues had taken place. One side suppurated; the other healed by the first intention. The suppuration occurred on the side first operated upon, and appeared to be due to the wound, in spite of precaution, having become infected with the patient's saliva, which escaped from his mouth in considerable abundance while his head was turned to that side during the second operation. It would perhaps have been better to have operated on one side at a time. All the wounds did well.

OPENING AND SCRAPING OF TUBERCULOUS ABSCESSSES AND SINUSES.

A man aged 25 (No. 1700 Harley) was admitted with a large psoas abscess. He had had pain in the lumbar region for six months, but there was no angular deformity. The abscess had been noticed for three months. The swelling was aspirated and 24 ounces of purulent fluid drawn off. Five days afterwards the abscess was opened, thoroughly scraped, filled with iodoform emulsion, and closed. On two subsequent occasions it was aspirated and injected with iodoform emulsion, and finally healed. The patient left the Hospital apparently quite well.

A girl aged 6 (No. 745 Casualty), with a tuberculous abscess about the extensor tendons of the right wrist, was treated by scraping and iodoform emulsion. She left the Hospital much improved.

A woman aged 66 (No. 1246 Coborn) was admitted with a large swelling at the back of the right shoulder-joint of eight months' duration. Some pus and caseous matter was let out, the cavity scraped, injected with iodoform emulsion, and the wound closed. Subsequently a swelling appeared in front of the shoulder-joint. This was opened, and a large quantity of a yellow glairy, semi-purulent fluid was evacuated. The old cavity was also reopened, again thoroughly scraped, and both cavities irrigated with iodoform emulsion. Both wounds after this healed soundly. Although no actual communication with the shoulder-joint could be discovered, it was thought that the swellings were connected with it, and that they were due to protrusion of the synovial membrane (Baker's cysts).

Tuberculous sinuses were healed by scraping and injection of iodoform emulsion in three patients. One only presented any point of particular interest. His liver reached to the iliac crest, and was evidently lardaceous. It rapidly decreased in size as the sinuses healed, and after a sojourn at Swanley the patient made a complete recovery. He had suffered from tuberculous disease about the sacrum for fifteen months, and was apparently dying when the scraping was performed. The operation was very thorough and prolonged and the shock great, but the convalescence after the first few days was very rapid.

A case of suppurating palmar bursal ganglion in a woman aged 67 (No. 1509 Harley), made a rapid recovery after scraping out the cavity and injecting iodoform emulsion.

SEQUESTROTOMY was performed in one case for long-standing necrosis of the femur, probably of tuberculous origin, but requires no special comment.

Removal of portions of the fourth, fifth, and sixth ribs were performed for an old empyema. The empyema healed slowly, and the patient was sent to Swanley.

LIGATURE OF POPLITEAL ARTERY.

The popliteal artery was ligatured for aneurysm of the right popliteal in a man aged 34 (No. 1636 Kenton). The aneurysm was about the size of a hen's egg. There was a probable history of syphilis ten years ago. An incision was made over the upper part of the popliteal artery through the upper part of the popliteal space. The vessel was very deeply placed and was with much difficulty exposed. It was tied with a silk ligature. A drainage tube was placed in the wound, which healed by the first intention. The aneurysm gradually hardened and decreased in size, and the patient was discharged cured on the forty-second day.

The popliteal artery was chosen because ligature of this vessel has been found to lessen the risk of gangrene, and holds out a greater certainty of cure. Gangrene, it is evident, is less likely to occur when only the popliteal is obstructed close to the aneurysm than when both the popliteal and femoral are blocked and two sets of collateral vessels have to be brought into play to carry the blood into the leg beyond the aneurysm, namely, one set from the femoral above the ligature to the femoral below, and another set from the femoral and popliteal between the ligature on the femoral and the aneurysm to the

vessels below the aneurysm. Recurrent pulsation and passive enlargement of the aneurysm without pulsation, which were not infrequent with us when ligature at the apex of Scarpa's triangle was our routine treatment, are due to a too free blood supply to the aneurysm in consequence of the length of vessel between the point of ligature and the sac. On the other hand, when the popliteal is chosen, the collateral vessels entering the artery between the ligature and the aneurysm, though too few in number to supply sufficient blood for recurrent pulsation or passive enlargement to occur, are still sufficient to ensure some circulation through the sac, and hence the formation of an active instead of a passive clot. As we all know, John Hunter taught that the artery was more likely to be atheromatous in the neighbourhood of the sac than at some distance from it. Subsequent observations, however, have shown that the popliteal is as often as not quite as healthy as the femoral. Before the days of antiseptics, ligature immediately above the aneurysm was no doubt attended with greater risks than was the Hunterian method, inasmuch as the connections of the sac were liable to be disturbed, and if the wound became septic, inflammation and sloughing of the sac, in addition to secondary hæmorrhage in the artery at the seat of ligature, was no doubt to be feared. With our modern surgical treatment these accidents need no longer be taken into serious consideration.

With regard to the steps of the operation of ligaturing the popliteal, this was the first occasion on which I had cut down upon it through the centre of the popliteal space, and it will be the last. It is certainly one of the most difficult operations that I have ever had to perform. The patient was a stout, thick-set, muscular man; the vessels lay at great depth from the surface, and the vein was intimately adherent to the artery, and required delicate dissection in a most awkward position to be freed without wounding its walls. Hitherto I have tied the popliteal artery with the limb lying on its outer side, taking the semi-membranosus as my guide. This method is almost if not quite, as easy as is ligature of the femoral at the apex of Scarpa's triangle, and is the one I shall certainly keep to in future.

NOTES ON SOME CASES AT THE GERMAN HOSPITAL.

BY
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The following short notes on in-patient and out-patient cases have mostly been selected on account of certain clinical features. I am quite aware that many of the observations are very incomplete, but shall be satisfied if some of them are found to be in any way of use.

I.—*Sudden Disappearance of Long-continued Renal Dropsy— Lineæ Albicantes and the Lines of Skin-cleavage.*

A German workman, A. S., aged 28, was admitted July 7, 1896, with nephritis and œdema. The urine contained much albumen, with blood casts, fatty casts, and granular casts. The daily amount of urine was much decreased, averaging between 400 and 900 c.c. in twenty-four hours. The dropsy afterwards got worse, and the distension of the skin over the lower part of the body was excessive.

Treatment consisted chiefly in rest in bed, milk diet (at least at first), and hot baths followed by sweating. Aperients were hardly needed, as there was already a tendency to diarrhœa. Southey's trocars were once or twice used for tapping the œdema. The same condition lasted for many months; sometimes the baths were discontinued. About the commencement of March 1897 the dropsy began to subside, and within a few weeks¹ it had disappeared altogether.

¹ It is possible that the final disappearance of the remains of the dropsy may have been accelerated by allowing the patient to get about a little. In some chronic cases of renal dropsy there comes a period when, in spite of dropsy still existing, moderate exercise seems to be useful. My father, Dr. H. Weber, tells me of a young dropsical woman whom he saw many years ago at the German Hospital with albumen and casts in the urine. After a prolonged period of dropsy, contrary to advice she made up her mind to go back to Germany, and therefore, as a preliminary, had to be allowed to get up and move about for a short time in the day. To every one's astonishment the dropsy then gradually began to disappear, and in a week or two, before she left the Hospital, she was free from dropsy, though there was still some albuminuria. My father has heard recently that she has a situation in Germany, and is doing well.

The urine still contained a great deal of albumen, but the total amount of urine passed in the twenty-four hours was much greater than before, averaging between 1900 and 2600 c.c. On one day Esbach's tube showed 4 per mille of albumen, when the amount of urine passed in twenty-four hours was 2100 c.c. The greatest daily amount of urine registered was, I think, 3400 c.c. In April the heart showed distinct signs of commencing hypertrophy; the apex beat could be felt in the nipple line in the fifth intercostal space, and the impulse was rather heaving. Some time afterwards the patient left the Hospital and returned to Germany.

When the dropsy suddenly disappeared, the skin over a great part of the body was at first striped by small lineæ albicantes, though these soon became very thin and indistinct. A good deal has been written upon the natural lines of skin-cleavage. Experiments made on the dead body¹ showed that if a pointed instrument like an awl (which must be circular in section) be thrust into the skin and then withdrawn, the mark left is not a small circular hole, but a minute slit. The direction of these minute slits shows the lines of skin-cleavage, which depend on the main direction of the bundles of connective tissue and the lines of tension in the part. According to O. Simon,² the arrangement of the cutaneous papillæ (first formed at a period when the connective tissue is already fairly developed) corresponds also to that of the connective tissue bundles. The maps of cleavage-lines have been utilised by some surgeons in deciding on the arrangement of their incisions through the skin.

It has occurred to me that the lines of skin-cleavage could be more accurately mapped out, than they have been by experiments on corpses, by observing the arrangement of the lineæ albicantes left after the sudden subsidence of dropsy. The lineæ albicantes are, in fact, formed by a natural process of skin-cleavage—that is, by separation of the main strands of connective tissue together with the super-imposed lines of cutaneous papillæ.

In the present case, when the dropsy subsided, the lineæ albicantes were seen on the whole to correspond fairly well with the lines of skin-cleavage as represented in the diagrams by Langer, &c. Over the abdomen and flexors of the joints and some other parts of the body the directions of the lineæ albicantes were observed to be much less regular, and gave rise to the suspicion that the regularity of the cleavage-lines has been somewhat exaggerated in published diagrams, though doubtless in writings on the subject the complexity of the lines in these positions has been duly acknowledged.

¹ K. Langer, "Ueber der Spaltbarkeit der Cutis," and "Die Spannung der Cutis." *Sitzungsberichte d. Kais. Acad. d. Wissensch.*, vols. xlv. and xlv., Vienna, 1862.

² "Die Localisation der Hautkrankheiten histologisch und klinisch bearbeitet." Berlin, 1873.

II.—*Syphilitic Affection of the Lungs and Pleura.*

P. S., aged 46, a fairly well-nourished married woman, had been under treatment at the Hospital for secondary syphilis. About one year afterwards she was sent into the Hospital by Dr. zum Busch, who had been seeing her amongst the out-patients, and who believed she was now suffering from a form of pulmonary syphilis.

For about four weeks before admission the patient had been troubled with a dry cough, worse at night, with hardly any expectoration. No history of previous chest disease.

Condition on admission.—There is a localised patch of bronchial breathing in the left lower axillary region of the thorax. Over this patch dulness to percussion is noted, and there is also some impairment of resonance over the greater part of the infra-scapular region on the same side. Pulse 64, regular. No fever. A localised gummatous affection of the pleura and lung with a little pleuritic effusion would account for the symptoms.

The patient was treated with iodide of potassium and given full diet. In a few days the bronchial breathing could no longer be detected, but some crepitation or scraping sound could be heard in its place. The cough soon ceased. The patient left the Hospital before the abnormal signs had quite disappeared. The urine, when tested, contained no albumen and no sugar. The patient's temperature was never found to be above 99° F.

III.—*Osteitis Deformans (Paget's Disease of Bones) with much Pain—Some relief from Iodide of Potassium—Greater relief (though not permanent) from Fracture of the Shaft of the most affected Bone.*

E. R., aged 59, a strong-looking man, came for out-patient treatment in 1896. The right femur is the most affected bone, and is considerably bent, but the left femur is also affected and slightly bent. His chief complaint is of pains in the right thigh, but both shin-bones and heels are likewise painful. The pains are rather worse at night than during the day. There is no evidence that the bones of the head, trunk, or upper extremities are yet affected.

History.—Patient was quite well till three years ago, when he began to feel pains in the right femur. Two years ago he noticed that the right femur was becoming bent. He has three healthy children, and denies syphilis.

Treatment by iodide of potassium seemed to relieve his pains to some degree. In 1897, however, he accidentally fractured the shaft of his right femur, and felt less pain afterwards for some time. The fragments united naturally. Dr. zum Busch, who has treated the patient recently, tells me that the pains have been very troublesome again, and again some relief has been obtained from iodide of potassium, though small doses of opiates have likewise been employed.

IV.—*Puerperal Polyneuritis, without any special Septic Infection.*

It is now recognised that pregnancy, without any distinct septic change, may be a cause of peripheral neuritis. The following case appears to be an example:—

E. L., a married woman, aged 29, admitted with more or less paralysis of all four limbs. The history is that five weeks before admission she had a fright, and two weeks later she aborted. Since then she had not been able to get about. She suffered with pains and weakness in the limbs.

On admission there was paraplegia and symmetrical "foot-drop," and in the upper extremities some radial nerve paralysis (with "wrist-drop") on both sides. Sphincters not affected. The whole picture resembled very much that of the ordinary alcoholic polyneuritis, but the mental condition was normal, there was no loss of memory, and no history of the abuse of alcohol. The thoracic and abdominal viscera appeared to be normal, and there was no albuminuria.

Under treatment by rest in bed, with galvanism and massage to the affected limbs, and small doses of strychnine, improvement was soon noted. At first patient could not feed herself, but she soon recovered the use of her upper limbs sufficiently for this purpose. The lower limbs, which from the commencement were more affected than the upper ones, were slower in their progress towards recovery. After some time she was able to walk easily with crutches, provided that the feet were kept from dropping by replacing the natural action of the damaged flexor muscles of the ankle-joints by plaster of Paris bandages or special elastic supports. When she left the Hospital (between three and four months after admission) she could walk to some extent without support of any kind and without any kind of apparatus.

In this patient the whole skin gave me the impression of being peculiarly thin and delicate. It occurred to me that this delicate condition in the skin might be shared by the peripheral part of the nervous system. The latter might be therefore peculiarly vulnerable to any toxins circulating in the blood, even to those which are probably almost normal during the pregnant condition.

It seems as if peripheral neuritis may result not only from the ordinarily generally recognised causes, such as diphtheria, typhoid fever, puerperal sepsis, &c., but also from a great number of conditions in which toxic substances are circulating in the blood. Amongst the latter group of actual or predisposing causes may be placed the ordinary puerperal condition, senility, the effects of exposure to cold, diabetes mellitus, and even chronic constipation.¹

Besides peripheral neuritis, spinal nervous affections may probably occasionally follow pregnancy.²

Indeed, most toxic agents, such as lead, arsenic, alcohol, &c., which are capable of causing peripheral neuritis, can at times in some individuals give rise likewise to affections of the central nervous system; and the toxic agent, whatever it may be in puerperal cases, forms no exception to the rule.

¹ *Vide* A. Bernstein, in *Wratsch*, 1898, No. 29, abstracted in *St. Petersburg Med. Woch.*

² *Vide* "Two cases of disease of the spinal cord following pregnancy and labour, under the care of Dr. J. B. Bradbury, with some remarks by Dr. F. Villy," *Lancet*, 1898, vol. ii, p. 324.

V.—*Lingual Hemiatrophy of Uncertain Origin.*

The patient, an unmarried woman, aged 22, came up as an out-patient for anæmia. The right half of the tongue was observed to be wrinkled and shrivelled. On inquiry, the patient told me that the condition was first noticed by chance by a doctor whom she consulted for anæmia four or five years previously. When the hemiatrophy really occurred is quite uncertain, but possibly it may have followed diphtheria, which she suffered from at seven years of age.

VI.—*Deviation of the Tongue and Soft Palate, due to Overaction of the Muscles on one Side.*

The patient, G. C., a man aged 36, came as an out-patient for bronchitis and dyspepsia. The peculiarity in regard to the tongue was noticed casually. When at rest, little if any difference can be detected between the two halves of the tongue. During movements, however, the excessive action of one half of the tongue and soft palate becomes noticeable. There then appears to be a condition of lingual hemispasm, the deviated tongue ending in a point, very unlike the condition in cases of lingual hemiatrophy. I could find no cause to account for the phenomenon.

VII.—“*Primary*” *Internal Hydrocephalus in the Adult.*

R. D., aged 21, a tailoress, born in Russia. Admitted June 1898. Eight days before admission patient began to suffer from headache and attacks of vomiting. The headache was at first frontal and then occipital. She gradually got weaker, and just before admission had retention of urine. The general practitioner who had her sent to the Hospital suspected a cerebral abscess. On admission, the pupils were found not to react to light and to be very small. There was cervical rigidity. Temperature 98.8° F. Pulse 84, slightly irregular. Urine, sp. gr. 1020; no albumen or sugar. Knee-jerks natural. The patient died shortly after admission.

Necropsy.—The ventricles of the brain were distended with serous fluid and the convolutions were flattened. There was apparent slight thickening of the pia-arachnoid at the base of the brain, but nothing distinctly abnormal could be found. The lining of the lateral ventricles appeared slightly granular, but a microscopical examination showed nothing noteworthy. No disease was found in the heart, lungs, &c.

Many similar cases have been recorded, but very little is known as to the origin of the condition. Gowers¹ says: “In some cases, however, the effusion into the ventricles is the only pathological change in an affection of acute and febrile course. The external meninges are healthy; the choroid plexuses may be the seat of distinct inflammatory changes, and the lining membrane of the ventricles may be finely granular; the adjacent brain tissue is softened, and the brain substance and convolutions are compressed. There is no indication of any

¹ Diseases of the Nervous System, 1893, vol. ii. p. 584.

processes of which the effusion could be a mechanical consequence, such as is an occasional cause of chronic hydrocephalus. The symptoms during life are those of an acute inflammatory disease, and resemble very closely those of tubercular meningitis. Hence it is commonly assumed that they are due to a ventricular meningitis, affecting chiefly the choroid plexuses, and causing an abundant effusion of serum. Although the pathology of the cases is obscure, no better explanation has yet been given."

The symptoms are not always equally acute. All cases cannot be fitted into the same theory. There may be threatening symptoms, such as chronic headache and drowsiness, preceding the final attack.¹ In the case of a boy aged 16, recorded by Dr. F. Taylor,² the fatal internal hydrocephalus was only an exacerbation of a condition of chronic hydrocephalus, which had probably existed from early childhood.

VIII.—*Supranuclear Facial Paralysis due to Syphilis, the Paralysis of one side of the Face being preceded by Attacks of Spasm on the other side.*

J. G., aged 27. Admitted 8th of November. The patient, a well-built, strong-looking man, had had syphilis two years ago. During the fortnight previous to his admission he had suffered from attacks of spasm affecting the left side of the face, and accompanied by a sensation of choking.

On admission there was marked paresis of the right side of the face, confined to the lower part of the face only. The speech was drawing, as in bulbar and "pseudo-bulbar" paralysis. There was complete absence of palatal reflex, though the palate was not paralysed, and there was no loss of sensation in the pharynx. No paralysis of the sixth cranial nerve. No optic neuritis noted. The orbicularis oris is affected with the rest of the lower face. Knee-jerks natural. No disease found elsewhere in the body. Urine, sp. gr. 1026; no albumen or sugar. No fever.

Mercurial inunction was begun immediately on admission, and iodide of potassium was given in 15-grain doses three times a day. In a few days the paralysis and other abnormal signs had disappeared, with the exception of the absence of palatal reflex, which persisted. No laryngoscopic examination or other irritation induced any movement in the palate.

Owing to the type of the facial paralysis, I think it must have been a part of the motor tract above the nucleus of the facial

¹ About 1887, when a student, a friend showed me a young man (æ. 18) who had strange drowsiness, &c., and who died with cerebral symptoms. The necropsy revealed apparently primary distension of the ventricles with cerebro-spinal fluid. There was a puffiness about the patient's face, and the case had been previously diagnosed by a great authority as one of myxœdema. It suggests itself in this case that symptoms due to internal hydrocephalus may have been mistaken for the apathetic condition, &c., of myxœdema.

² Trans. Clinical Society, London, 1897, vol. xxx. p. 175.

nerve which was affected. It is difficult to understand why the paralytic symptoms were preceded by attacks of spasm on the other side of the face, but I am told that in this respect similar cases are known. The absence of palatal reflex and the temporary affection of the speech I am inclined to regard as "pseudo-bulbar" phenomena, such as sometimes occur in ordinary hemiplegia from cerebral hæmorrhage.

IX.—*A Case of Non-progressive Disease on one side of the Brain.—
Alternation of a sensible Facial Expression with "Idiotic"
Laughter or Grinning.*

The patient, W. S. T., was shown by me at the Clinical Society in February 1897. At that time, however, I paid little attention to the alternating expression of his face, and it is to this point that I shall now allude.

The patient's illness commenced very gradually several years ago. When working for an examination at 18½ years old, his mother noticed that he often used to laugh for no reason whatever. Hemiplegia commenced very gradually when he was nineteen years old, following, it is said, a bicycle accident. Apparently the paralytic symptoms have not increased during the last few years; in fact, they seem to me less marked now than when I first saw him, and when I brought him to the Clinical Society.

There is no evidence of syphilis, either inherited or acquired. The following notes are chiefly taken from the account in the "Transactions of the Clinical Society" for 1887:—

The patient, aged 24, has left hemiplegia involving the left limbs and the lower part of the left side of the face. The arm is most affected, and shows signs of considerable trophic disturbance (especially tendency to chilblains). There is not much rigidity. Knee-jerks are fairly natural and equal. His speech is drawling, and has a somewhat nasal character, owing to considerable paresis of the soft palate. There is no anæsthesia of the pharynx, but there is absence of palatal reflex.

Although he has no voluntary power over his soft palate, and very little over the left side of the face, yet when he laughs spontaneously—as he does with abnormal frequency—the left side of the face moves equally with the right side,¹ and the soft palate is firmly and briskly drawn up. The electrical reactions of the paralysed limbs, as well as those of the soft palate, have been found perfectly normal. By laryngoscopic examination the vocal cords can be seen to move freely.

The general condition of the patient improved somewhat with tonic medicines and mild aperients for the relief of his constipation.

Diagnosis.—The very gradual onset of the hemiplegia appears to exclude hæmorrhage or thrombosis as the cause, while the absence of optic neuritis, as well as of other symptoms of a cerebral tumour, negatives the view that the symptoms can be due to a new growth or a tuberculous or gummatous mass. I suppose that there may be some sclerotic or atrophic process involving a great part of the right side of the brain. Syphilis cannot, of course, be absolutely excluded.

¹ It is characteristic of supranuclear facial paralysis that emotional movements are affected less than voluntary movements.

The affection of the speech and the absence of palatal reflex do not prove that the affection is not confined to one side of the brain. Pseudo-bulbar symptoms may occur with a lesion on one side of the brain only. Marie and Kattwinkel¹ examined fifty cases of left and fifty cases of right hemiplegia, and found that in twenty-five of the left hemiplegias the pharyngeal reflex was abolished, whereas it was absent in only two of the right hemiplegias. The laryngeal reflex was abolished in 22 per cent. of the left hemiplegias and diminished in 36 per cent.

The patient's frequently recurring "idiotic grin" may possibly be explained on the theory of alternating action of the two sides of the brain. The patient may be supposed to think and work chiefly with the left side of the brain—that is, the good side. When, however, his attention is temporarily relaxed, the right (diseased) side of the brain may be supposed to come into action, the idiotic laughter evidencing the diseased condition of that half of his brain. Manacëin,² thinking that the left cerebral hemisphere is normally more active in the working state and more exhausted during fatigue and sleep, has made experiments, and found that on lightly tickling either side of the face of sleeping persons, the sleeper made repellent movements invariably with the left hand, if he was right-handed. In eight left-handed persons, however, the right hand alone was moved. In young dogs exhausted by deprivation of sleep, reflex movements only occurred on one or other side, alternating periodically, as if one half of the brain were temporarily asleep.

I must allow, however, that the recurrent laughter in the present case need not be taken as evidence in support of any theory of alternating action between the two halves of the cerebrum. Some such theory is only put forward as a possible explanation of the phenomena observed.

X.—*Aphasia in a Child (Congenital or of very Early Life).*

F. S., aged 5, was brought to the out-patient department in 1897. He is a well-developed, good-looking, though delicate-looking boy, and can understand what is said to him,³ though he cannot speak. He tries to pronounce some words, but the sounds he utters in the endeavour are more like those of a wild beast than an endeavour to speak the human language. No abnormality noted in the formation of the palate or in

¹ *Vide* Dr. Klippel in *La Presse Medicale*, January 29, 1898.

² *Vide* the abstract in *Neurol. Centralbl.*, 1894, xiii. p. 913.

³ The boy was taken into the Hospital temporarily for observation, and the Sister of the Ward, who was able thus to observe the child, confirmed the view of his general intelligence.

other parts of the body. At two years of age the boy is said to have had a "sunstroke," at least some illness which lasted about a week, and during which ice-bags were applied to the head. Whether the aphasia dates from this time, or is really congenital, I have not been able to ascertain, and the question is an unimportant one. No methodical attempt has yet been made to teach the child to understand writing and printing, but he can write part of the alphabet and some numbers.

Amongst Dr. Gee's "Clinical Aphorisms"¹ is the following :—
 "Boys are sometimes very backward in learning to talk; but if a boy cannot talk at four years of age, he is, with a single rare exception, either deaf and dumb or an idiot. The former alternative can easily be excluded. *The exception mentioned is the condition of congenital aphasia.*" I have alluded to the present case as practically, if not actually, affording an example of the rare exception mentioned by Dr. Gee.

Spontaneous cure has been said to occur in some cases of congenital aphasia. Herodotus narrates that the son of Cræsus, king of Lydia, who from birth had been unable to speak, suddenly gained the power of speech to beg for his father's life. Aulus Gellius gives the analogous case of a Samian athlete.

A quite recent case is vouched for by Dr. Bastian in his recent book on aphasia,² where Wigan's case is also fully quoted.³

Professor Drouot of Paris, I believe, recorded the case of a child who remained dumb after a serious illness at the age of two. When twenty-five years of age, however, this dumb person suddenly uttered the word "tabac," when he wanted some tobacco, and afterwards was able to speak properly.

The last case, though perhaps not strictly one of congenital aphasia, would seem to hold out some prospect of a spontaneous cure being possible in the boy whose case I have given, and whose "dumbness" may likewise be due to an illness at two years of age.

In regard to the possibility of the "dumbness" being due to a bilateral lesion of the brain originating at birth, or during the illness at the age of two, it seems to me unlikely that such a lesion could produce dumbness unaccompanied by obvious "pseudo-bulbar" symptoms.

XI.—Cerebral Hæmorrhage in a Child.

Frederick M., aged 2½ years, admitted June 1896. He is said to have fallen out of the perambulator on to his head three days before admission. Since then there has been vomiting, &c., the symptoms commencing on

¹ St. Bartholomew's Hospital Reports, 1896, vol. xxxii. p. 57, No. 256.

² H. C. Bastian, "A Treatise on Aphasia," London, 1898, p. 6.

³ A. L. Wigan, "The Duality of the Mind," London, 1844, p. 377.

the same day as the accident. *On admission:* drowsy condition; some rigidity of neck; ophthalmoscopic examination, negative. A few days later the child was in a comatose condition, and there was complete (flaccid) paralysis of the left limbs, with the head and eyes turned to the right. The paralysed limbs became spastic on the next day. The right pupil was larger than the left, but neither reacted to light. There were recurrent fits of dyspnoea, accompanied by dilatation of both pupils and tetanic movements of the left arm. The child died on the eleventh day after the supposed injury. At the post-mortem examination I understand that a hæmorrhage with a softened area of brain tissue was found involving the right internal capsule. There was no fracture of the skull, or any lesion on the outside of the brain. The softened brain tissue around the hæmorrhage was examined microscopically for evidence of tumour, with negative results.

XII.—*General Paralysis of Adolescence.*

S. W., aged 19, was brought to the out-patient department by his father.

History (from the father).—The patient was quite well till one and a half years ago. He is said to have been previously intelligent and normal in every respect. Then tremors developed, which have been getting gradually worse. He has been losing strength and falling off in mental power. His memory is impaired. He is very apathetic, and does not grumble.

Present condition.—The tremors when noticed affect all the limbs, and are somewhat diminished by voluntary movements. The right pupil reacts hardly at all to light or accommodation, but the left pupil, which is sometimes the larger of the two, can be made to react thoroughly by repeated stimulation of the retina, *i.e.* by repeatedly flashing the light into the eye. No nystagmus. Knee-jerks just obtained. The mental condition is as described by the father.

This is a fairly typical case of general paralysis occurring at an early age; but there is no history of congenital syphilis. The case was not seen again.

Megalomania and other forms of insanity are apparently less common in juvenile general paralysis than in that of the middle period of life. Juvenile cases are therefore likely to be brought to general hospitals for advice. I have also seen it stated that typical megalomania is now less frequently noted in ordinary cases of general paralysis than it formerly was. If this be so, cases of ordinary general paralysis are likely to be met with more frequently than formerly in the out-patient departments of general hospitals. Actually, I believe, these cases are not very rarely met with at general hospitals, and students should learn the importance of recognising them.

XIII.—*Syringomyelia with very Asymmetrical Symptoms—History of Traumatism.*

S. J., a Polish Jew, aged 43, was admitted in March 1897.

Condition on admission.—Considerable muscular atrophy in the left upper extremity, most noticeable in the thenar and hyperthenar eminences. In the affected muscles the ACC is equal to or greater than the KCC, and only slow movement, instead of the normal sharp movement, is obtained with galvanism. Reaction to Faradism much diminished. Sensation to touch is natural, but sensation to temperature is diminished over the whole of the left arm, and pain cannot be felt over a limited area of the hand. Some trophic disturbance noticeable in the fingers. The right upper extremity is less affected, though there is certainly some atrophy in the thenar and hyperthenar eminences, with trophic disturbance resulting from old whitlows in two of the fingers. Some spinal scoliosis has existed for a long time. The man attributes the condition of his left arm to an injury received about four months ago (he thinks the left shoulder was dislocated).

This case presents features similar to those of a stage in the case of a patient (L. Türkheimer) described by J. Hoffmann of Heidelberg in *Volkmann's Sammlung Klin. Vorträge*, No. 20.

The symptoms of syringomyelia have been attributed to traumatism in some cases, but in the present case the disease was evidently of earlier date than the injury. The latter may, however, have produced exacerbation of the symptoms by causing some hæmorrhagic effusion into the grey matter¹ of the portion of the cord already affected by syringomyelia. At any rate, cases of this kind might give rise to difficult questions in regard to insurance claims.

The patient was treated in the Hospital for eczema on the left side of the chest. This soon cleared up under the use of Hebra's ointment and rest in bed. The patient left the Hospital soon afterwards.

XIV.—*Functional (almost complete) Anæsthesia in a Man—Recovery under Thyroid and Spermin Treatment.*

O. Z., aged 21, a German, born at Riga. Admitted April 1897. The patient is a well-built, muscular man, a stoker. On admission he could practically feel nothing, except over a small area bordering on the genital organs. The rectum was likewise unaffected, and the patient could feel naturally when his bowels acted.² Owing to anæsthesia

¹ Vide "Traumatism and Hæmatomyelia as Causes of Syringomyelia," by Dr. W. G. Spiller, *International Medical Magazine*, April 1896, p. 193; also "A Study of the Lesions in a Case of Trauma of the Cervical Region of the Spinal Cord simulating Syringomyelia," by Dr. J. H. Lloyd, *Brain*, 1898, Part I.

² In another case of hysterical anæsthesia, the absence of sensation during the passage of a motion was particularly noted and complained of by the patient.

at the back of the mouth and pharynx, any laryngoscopic examination was peculiarly easy.

The patient told us that he had been treated in a German military hospital for three-quarters of a year. When he left the hospital he had not quite recovered, and was freed from liability to military service.

Thinking that hysterical anæsthesia must depend on some slightly abnormal condition of the nutrition of the cerebral cortex, and knowing that both testicular and thyroid substance exercise a great effect on the general metabolism and on that of the nervous centres, I determined to try treatment by these substances in the present case. Moderate doses of Burroughs, Wellcome & Co.'s tabloids were therefore employed.

Under treatment sensation gradually returned. On the 3rd May the remaining anæsthesia was confined to the four limbs. It may be noted, by the way, that the upper limit of the anæsthetic areas might be expressed by a band encircling each limb, like a garter or the upper border of a stocking, a condition (as Charcot has pointed out) almost pathognomonic of hysterical anæsthesia. No disturbance of sensation could be detected by the resident medical officer when the patient left the Hospital on May 19.

It is quite possible that the treatment had nothing to do with the restoration of sensation, which often occurs spontaneously, as well as by a great variety of methods of treatment. It is only reasonable to suppose, however, that any drug like those employed capable of exercising a decided action on nervous metabolism may be able to remove the functional disturbance in the cerebral cortex, which probably forms the basis of hysterical anæsthesia.

In the present case the patient had perhaps a "lymphatic" tendency, for his tonsils were somewhat enlarged. He was not apparently excitable, but rather of a phlegmatic type. Hence the use in moderate doses of thyroid and testicular substances, which excite metabolic activity, was certainly not contra-indicated. Of course no conclusions can be drawn from a single case, but if these drugs are tried in cases of functional anæsthesia, patients in whom there is no special nervous excitability or emaciation should be selected.

XV.—*Fæcal Vomiting, the Vomiting of Enemata, and the Symptoms of Intestinal Obstruction in Hysteria—Spasm at the Lower Orifice of the Bowel with Reversed Intestinal Peristalsis.*

The following case was under the care of my colleagues, Dr. Port and Dr. Michels, and it is to their kindness that I am indebted for permission to describe it. Its study helps much towards the correct interpretation of similar cases. A few extreme cases of the same kind are found recorded in the literature of the subject, and some of these I shall afterwards allude to. Cases, however, presenting analogous symptoms, though of lesser magnitude, are comparatively common, and their correct interpretation is therefore of practical importance.

R. S., aged 22, apparently a fairly healthy-looking woman, was admitted into the German Hospital, 19th October 1896. According to the history given, the patient had been quite healthy up till the time of her marriage in 1896. On the night of her marriage she spat out some blood, and from this time apparently the commencement of her hysterical symptoms must be dated.

The chief of these symptoms are the following :—Vomiting (sometimes with a little blood), distension of the abdomen, and great constipation. There was no evidence that the idea of possible pregnancy had anything to do with the distension of the abdomen, which was afterwards found to disappear at once under chloroform. The vomiting persisted on and off. At one time there was undoubtedly faecal vomiting. On some occasions when an oil enema was administered, some of the oil reappeared in the vomited matter. In order to guard against imposture and to obtain an accurate diagnosis, an enema coloured with methyl blue was administered by the Sister. Some of the methyl blue appeared in the vomited matter within ten minutes after the administration of the enema. Any deception on the patient's part was altogether impossible.

This observation and the history of hæmatemesis furnished reasonable grounds for supposing that a fistulous communication between the colon and stomach or duodenum might exist. It may be noted, however, that when the gastric contents were evacuated by the syphon tube immediately after an enema containing methyl blue had been administered, no methyl blue was found to be present in the contents of the stomach. This showed that the methyl blue injected by the rectum took at least some minutes to reach the stomach. To make a long story short, it may be stated at once that during the patient's residence in the German Hospital two careful exploratory laparotomies were performed. At neither of them, however, was any abnormal condition whatever detected. One of the laparotomies was performed below the umbilicus, the other above. At the second operation the stomach itself was opened and explored. On both occasions the wounds healed rapidly, and no unsatisfactory results occurred. There may, indeed, have been some temporary improvement in the general condition following the operation. The improvement, however, was certainly not permanent, and the patient's condition varied considerably at different times.

During the patient's residence in the Hospital her temperature was found every now and then to be above the normal, and this appeared to be especially the case when she was not being closely observed. It was not, however, proved that she simulated the fever by manipulating the thermometer. Before the patient left the Hospital (4th February 1897), she looked well, had a fresh colour, and moved about quickly, but was still troubled with vomiting, constipation, and distension of the abdomen.

Afterwards she came under the care of Mr. Treves at the London Hospital. Her symptoms there were much the same as at the German Hospital, and so convinced was Mr. Treves that some local disease might be present that he determined to do a third laparotomy. This was actually performed, and though the exploratory operation gave a negative result, no evil consequences resulted, but, on the contrary, the patient's condition seemed to be improved after the operation.

Mr. Treves has alluded to the case in his paper on "Abdominal Section as a Medical Measure," read at the Medical Society of London on 28th February 1898.¹ The following is the passage in question, which I will quote at full length, since it amply confirms some of the points alluded to above:—

"As an extreme instance of the second class of cases, in which the symptoms conform to the manifestations of no known disease, the following example may be given. The patient was a woman aged 24, who was admitted into the London Hospital under my care on February 5, 1897. The following was her somewhat exceptional history:—She had been quite well until twelve months before admission. A year ago she had been seized with violent pain of a paroxysmal character in the left side of the abdomen. This pain lasted some two or three hours, and came on, as a rule, twice a day. The bowels became very confined, and five months before admission she was seized with fæcal vomiting. Previous to the onset of this vomiting no action of the bowels of any kind had taken place for four weeks. She was admitted into a metropolitan hospital and the abdomen was opened. Nothing abnormal was found. For a week after the operation she was perfectly relieved of all her symptoms; at the end of that time the symptoms of intestinal obstruction, with fæcal vomiting and rise of temperature, returned; it was then noticed that injections given by the rectum were returned almost immediately by the mouth. It was assumed that some fistulous communication existed between the stomach and the colon. A second abdominal section was therefore carried out; the stomach itself was opened; no kind of communication between it and the bowel was discovered, and both viscera were free of adhesions. As after her discharge from the Hospital her symptoms of obstruction, with pain, fever, and vomiting, still continued, she sought admission into the London Hospital. Shortly after admission she exhibited definite hysterical attacks. She had, by some means, acquired the power of causing the mercury in the clinical thermometer to rise to the limits of the instrument. One medical man who had attended her wrote to

¹ Transactions of the Medical Society, vol. xxi. p. 224.

say he had recorded a temperature of 110° . No action of the bowels could be obtained. She would howl with pain for hours. All food taken by the mouth was vomited; nutrient enemata were given by the rectum, but they also were vomited. A careful investigation of this vomiting of enemata was carried out by my House-Surgeon, Dr. Sears, with the aid of the Sister of the Ward. An enema of castor-oil was given; within ten minutes from the time of the introduction of this drug into the rectum the whole of the castor-oil, as demonstrated by actual measurement, was vomited from the mouth, together with a small scybalous mass. A few days later, in order to further test this phenomenon, an enema of one pint of water stained a deep colour by methylene blue was injected into the rectum by the Sister in the presence of the House-Surgeon. The whole of this enema, to the amount, that is, of one pint, was vomited by the mouth in ten minutes. I was extremely ill-disposed to carry out a third abdominal section. The only excuse for it was that, while at the previous operations the stomach had been carefully examined, an equally detailed examination had not been made of the colon. As the patient resisted all forms of treatment, vomited all she took by the mouth, vomited nutrient enemata, and had no action of the bowels, and as she was becoming somewhat alarmingly feeble, I resolved once more to carry out an abdominal section as a forlorn hope. The abdomen was opened in the left semilunar line above the level of the umbilicus. The rectum and the whole length of the colon were examined with the greatest care and minuteness, and found to be absolutely normal. Some few adhesions existed around the scar of the wound in the stomach, but, with this exception, the abdominal cavity did not exhibit any trace of disease. The patient thought fit to be very ill after the operation, her respirations at one time reaching 140; she could not be induced to speak, and she went through all the popular phenomena of dying with startling effect. As these death-bed displays were not encouraged, she took finally to screaming, and became so intolerable in the ward that she was removed to an isolated room. The absence of an appreciative audience appeared to have an immediate effect upon her symptoms, for she soon ceased to complain, the bowels acted without difficulty, the vomiting ceased, the temperature remained normal, and before she left the Hospital, on March 19th, she may be said to have been perfectly restored to health. The highest temperature she was able to develop while in the Hospital was 109° . She had stated that she could produce this heroic fever by very slowly squeezing the bulb of the thermo-

meter between her teeth. An attempt to produce this elevation of the mercury by the means indicated only led, however, to the destruction of two thermometers."

After leaving the London Hospital the patient again attended the out-patient department of the German Hospital, where, in September 1898, I saw her again whilst doing the out-patient work for my colleague, Dr. Michels, during his temporary absence. He has been treating her with small doses of arsenic. She has gained in weight apparently, and seems healthy and quite sensible in her manner. There was no longer any vomiting, but a marked tendency to flatulent distension of the abdomen still persisted.

It would be a mistake to suppose that extreme symptoms of this kind are confined to the female sex, for this type of hysterical disorder is likewise found in men, just as most other forms of hysteria are. The following case¹ from Professor Senator's clinique in Berlin presents certain features in common with those of the preceding case.

The patient, A. H., was a shoemaker, aged 29. He was tolerably healthy up to the time of his military service in 1890. In this year by some accident he fractured one of his left ribs. Whilst in the hospital for this injury he suffered from obstinate constipation, which has persisted more or less since then. When he recovered from the fractured rib he was freed from liability to military service, and then visited a number of hospitals on account of his constipation. In 1893 he is said to have had fæcal vomiting, and in 1894 was supposed to have intestinal stenosis. Besides persistent vomiting, severe constipation, and distension of the bowels, with pain in the lower left region of the abdomen, patient also suffered from polyuria resembling diabetes insipidus. About the end of the year 1894 an exploratory laparotomy was performed with negative results. The patient's condition, however, was temporarily improved after the operation. Later on he had obstinate constipation for fourteen days, and a second laparotomy was performed. A fibrous band was removed from the peritoneum, but the surgeon thought that the presence of this band had probably nothing to do with the symptoms. The patient's condition again improved after the second operation, and for some time he could again do his work. However, in November 1897 he was troubled with his old symptoms. In January 1898 the patient was admitted into the Charité

¹ Vide Strauss, "Hysteria Virilis unter dem Bilde der Chronischen Darmstenose. Zweimalige Laparotomie." *Berliner Klinische Wochenschrift*, 1898, No. 38, p. 838.

Hospital at Berlin, with obstinate constipation, continual vomiting and distension of the abdomen. The bowels were made to act and the vomiting relieved by energetic treatment, namely, lavage of the stomach, enemata, and purgatives. Morphium, to which the patient had already become accustomed, was administered on account of the abdominal pains, &c. In spite of the treatment a motion of the bowels was only obtained about every four or five days. Every two or three weeks there was an ileus-like attack, with persistent vomiting and absence of any action of the bowels, not even the passage of flatus. Lavage of the stomach relieved these acute exacerbations. There was no genuine faecal vomiting. The urine was increased in quantity, of rather low sp. gr. and pale colour, without albumen or sugar, and generally without much indican. Sometimes there was retention of urine, lasting twenty-four hours, when the bladder nearly reached up to the umbilicus. This retention of urine was sometimes relieved by a hot bath, but sometimes the use of a catheter was necessary. Other occasional symptoms were dyspnoea, migraine, hiccoughing, &c. On the 18th May 1898 there was a typical hysterical attack, and then the great distension of the abdomen suddenly disappeared. In the evening the bowels were opened spontaneously for the first time. After this the patient's condition was much improved; he could get about again, and his abdomen felt flaccid; purgatives, however, were still usually necessary.

Gilles de la Tourette¹ has collected a number of cases presenting analogous symptoms, including several examples of the vomiting of enemata.

In a hysterical woman aged 27, Briquet² found that an enema of coffee was partially returned by the mouth fifteen minutes after its introduction per rectum. A coloured substance was injected into the rectum to settle all doubts on the question, and twelve minutes afterwards some of it appeared in the vomit. The investigation was so arranged in this case that no deception was possible.

There can hardly be a doubt that these phenomena are due to a reversal of intestinal peristalsis. Jaccoud³ records the case of a hysterical woman who suffered for some days from vomiting of faeces. Every precaution was taken to avoid the possibility of deception. Though the patient did not seem to be gravely ill, this extraordinary vomiting, which Jaccoud terms "buccal defecation," continued until the eighth day, when

¹ *Hystérie Paroxystique*, Paris, 1895, vol. ii. p. 361.

² Quoted by Gilles de la Tourette, *op. cit.*, p. 363.

³ *Ibid.*

the bowels began to act again in the natural manner. A few weeks afterwards this patient died of typhoid fever, and at the necropsy nothing was discovered to explain the fæcal vomiting. The ileo-cæcal valve appeared natural in every respect.

Tullio,¹ in his paper on "Reversed Peristalsis," records a case of this kind, where the intestinal movements could be observed through the abdominal walls. The movements were noted to start from the region of the sigmoid flexure, and to pass along the colon into the small intestine. A lump then began to form in the pyloric region, and continued to increase until, the pyloric valve doubtless opening, vomiting took place. These intestinal movements were increased when an enema was administered, and ceased after it was vomited.

Many of the most typical symptoms of hysteria, such as hysterical hemiplegia and hysterical anæsthesia, can be explained on the supposition of there being some disturbance in the function of a portion of the cerebral cortex. Can reversed intestinal peristalsis be explained in this way? Obstinate constipation in hysterical cases may often doubtless be attributed to a spasmodic condition at the lower orifice of the bowel, a condition which may possibly be brought about by disordered action of the brain. It is further possible that this obstinate spasm, and the accumulation of fæces above it, may give rise to a reversed peristaltic action of the intestine, similar to that caused by complete occlusion of the bowel by other means. This supposition, on the whole, affords a satisfactory theory of fæcal vomiting and vomiting of enemata in hysteria. That ordinary vomiting may be of cerebral origin is proved by its frequent occurrence as a symptom in cases of cerebral tumour and other diseases and injuries of the brain, as well as by its occasionally taking place from psychological causes. A possible explanation of the fæcal vomiting in hysteria is to regard it as due to an extreme degree of the common nervous disturbance, which, in minor cases, gives rise only to the usual form of hysterical vomiting. In ordinary cases the movements of the upper portion of the alimentary tract are affected, whilst in the extreme cases the peristaltic action of the whole canal may be reversed.²

¹ Quoted by Gilles de la Tourette, *op. cit.*, p. 366.

² Even in persons who are not hysterical the duodenum is often involved in the process of vomiting, as is shown by the frequent presence of bile in vomited matter. I have heard also, on medical authority, that in the case of a certain delicate phthisical man, intractable sea-sickness led at last to a kind of fæcal vomiting, as if the whole alimentary canal had become affected with the reversed motion, which was at first limited to the stomach. Other explanations can, of course, not be excluded in this case.

XVI.—*Cirrhosis of the Liver—Effect of Peritoneal Adhesion in Arresting the Symptoms of Hepatic Cirrhosis.*

The patient, E. B., a cooper, aged 44, a large heavy man with old cirrhosis of the liver, was admitted on the afternoon of the 18th October 1898, at about 3 P.M., in a collapsed condition, with severe dyspnoea and duskiness of face.

History (gathered partly from patient and partly from relatives).—On the previous day (17th October) patient had been to work as usual. Had mussels for supper at about 7 P.M. The mussels are said to have been absolutely fresh and of perfectly good appearance. He ate about fifty of them, his wife had about twenty, and his two children about ten or more. Neither his wife nor the children were ill after eating the mussels. The patient is said to have slept for some time after the meal, and then to have gone to a concert at about 9 P.M. He drank a good deal and was drunk. During the night he had been vomiting, and had diarrhoea in the morning. The man had had attacks of vomiting and diarrhoea on previous occasions, and therefore probably less attention was paid to it than would ordinarily have been the case. Patient became worse during the morning. Pains all over the body and back of head. Later on he came by tramway to the Hospital, and whilst sitting amongst the out-patients his condition became much graver.

The man was put to bed and treated with subcutaneous injections of camphor in oil. Owing to the history of the mussels, a little calomel was given, and there were some motions of the bowels afterwards. I came to see the man at about ten o'clock in the evening. He is a large heavy man with a good deal of subcutaneous fat (said to have been much fatter formerly). Respiration about 40 in the minute, pulse about 108, regular, weak. Conjunctivæ suffused. The tongue is parched, the breath offensive, and there is excessive thirst. Nothing special found by examination of the heart and lungs. The liver is felt hard and fairly uniformly enlarged. No ascites. Much subcutaneous fat over the abdomen, and some dilation of the subcutaneous veins. The left leg shows superficial ecchymosis from a recent injury. Some œdema of both legs, and a little over the sacrum. Urine cannot be obtained for examination, as none is being passed at present.

A little later on his condition was no better, and owing to the dyspnoea and probability of pulmonary engorgement, I decided on a small venesection. After the withdrawal of about four or five ounces of dark thick blood (which came slowly) from a vein in the forearm, the patient, who had already spoken somewhat strangely, became anxious, excited, and very violent, and great force had to be used to hold him while the bandage was applied. Immediately afterwards he became stiff and his face livid. *Exitus.*

Early History of the Case.—The patient was treated at St. Bartholomew's Hospital (Luke Ward) in 1892, and Dr. Gee, under whose care he was, has kindly allowed me to make use of the notes of the case. The following is an abstract.

Past History.—Denies syphilis. Has taken freely of beer, but denies excess of spirits. Dr. Gee himself notes "much spirits last ten years." Patient was never laid up before.

Family History.—Father died of phthisis at age of 56. Mother died of phthisis at age of 50.

About the 8th of January 1892, patient fell and struck the left side of his chest. He was not laid up at the time. About 31st March he

noticed a swelling of the abdomen. There was no pain in the belly, but a sensation of tightness. There have been occasional attacks of epistaxis. No hæmorrhoids. Was admitted to St. Bartholomew's Hospital on 23rd May 1892.

Condition on Admission to St. Bartholomew's Hospital.—A strong plethoric-looking man. Ascites. The abdomen uniformly distended. Congested cutaneous venules. Legs slightly œdematous. Cardiac apex beat in 4th intercostal space; sounds normal. Friction over left base of chest. Pulsating jugular vein. Pulse somewhat jerking. Urine: sp. gr. 1028; no albumen; pink urates.

On the 25th May paracentesis abdominis was performed, and 19½ pints were withdrawn. The fluid was clear, not bloody, specific gravity 1020. The liver could then be felt about two inches below the ribs, hard and uneven. The belly soon began to fill up again, and patient, who had left the Hospital, was readmitted on 23rd June with extreme ascites, and with anasarca of the legs and scrotum. Paracentesis abdominis was again performed, and 24 pints of clear serous fluid were withdrawn, specific gravity 1016. The edge of the hard and uneven liver could then be felt about three inches below the costal margin. On 25th June there is a note that the abdomen was filling fast, and on 28th June that the œdema of the legs had nearly subsided. Patient however discharged himself and left the Hospital on 9th July 1892. The chart shows that the temperature frequently rose to about 100° F. in the evening; on two evenings it was about 101° F. At first the patient received a draught containing five grains of copaiba resin three times daily, and afterwards the "Haustus Scoparii Co." of the St. Bartholomew's Hospital pharmacopœia three times daily.

After his illness at St. Bartholomew's the patient perhaps took less alcohol. There was no return of the ascites. About 1893 he was severely ill with erysipelas. In October 1897, after the death of a son, he began to drink more, and brought up (from the stomach?) a good deal of blood. I saw him then. There was no ascites. A peculiar, very disagreeable odour of the breath was noted. Since this time I understood from the patient that he left off drinking, except that he sometimes took gin "to make his water run." According to his wife, however, he was hardly ever really sober during the last months.

Necropsy (20th October 1898 at 10.30 a.m.).

The body is that of a large heavy man. Face very livid.

Brain.—Nothing noteworthy; weight about 50 ounces.

Lungs.—Engorged with blood. Weight of the two lungs about 64 ounces. Left lung very adherent to the diaphragm.

Heart.—Weight about 15½ ounces. Muscular substance flabby. Much dark fluid blood flowed out on cutting through the large vessels at the base. No disease of the valves or of the coronary arteries.

Abdomen.—Universal peritoneal adhesion. The coils of intestines can mostly be easily separated with the fingers. Mesentery thickened and tough. The peritoneum over the liver and diaphragm is exceedingly thickened and hard, but not so much as part of the capsule of the spleen, which is of practically "cartilaginous" consistence.

The Liver, after its separation from the peritoneum, weighed 89 ounces, and showed a good deal of cirrhosis, most marked in left lobe. In this lobe some little encapsuled nodules of uncertain nature were noted, which projected from the cut surface. Microscopic examination of the liver showed that the amount of the cirrhotic change was considerable, but varied somewhat in different parts. There was no lardaceous change. The nodules mentioned were found to be portions of hepatic substance completely encapsuled by strands of cirrhotic tissue; the liver cells included in these nodules had undergone a degenerative change (chiefly fatty degeneration).

The Spleen weighed about 11 ounces, and was enveloped in dense connective tissue resulting from perisplenitis.

The Kidneys were large, and weighed together 22 ounces, the capsules stripped readily. Microscopic examination showed some interstitial nephritis. No lardaceous change.

The Stomach mucosa was dotted over with black specks (the remains of former hæmorrhages?). * The organ was very adherent to the surrounding viscera.

Remarks.—It has suggested itself that the original chronic peritonitis, perisplenitis, and perihepatitis in this case might have been due to the colon bacillus, the infection from the intestines being facilitated by the diminution of the protective action of the liver consequent on the hepatic cirrhosis.

In favour of the view that the peritoneal effusion, for which the patient was treated in 1892, was of an inflammatory nature, is the relatively high specific gravity (1020) of the fluid first drawn off, and the patient's tendency at that time to have fever in the evening.

The present case may be considered as illustrating an apparent arrest of the signs of hepatic cirrhosis following the formation of peritoneal adhesions about the liver and spleen.

Into the question of how far the final symptoms were due to the mussels which the patient had eaten I will not enter here. With my treatment I can, unfortunately, not feel satisfied. The pulmonary engorgement was probably due partly to weak action of the left ventricle, and partly to imperfect action of the diaphragm hampered by adhesions. The withdrawal of the relatively small amount of blood (which, however, must always come from the left ventricle rather than from the right ventricle) may have altered the supply to the brain, and, together with the patient's violent movements, may have led to the final syncope.

PROCEEDINGS

OF

THE ABERNETHIAN SOCIETY

FOR THE SESSION 1897-98.

OFFICERS.

<i>Presidents</i> . . .	Mr. W. L. BROWN and Mr. J. HUSSEY.
<i>Vice-Presidents</i> . . .	Mr. T. J. HORDER and Mr. A. L. ORMEROD.
<i>Hon. Secretaries</i> . . .	Mr. E. S. HEWER and Mr. H. THURSFIELD.
<i>Additional Committee-men</i>	Mr. E. TALBOT and Mr. J. WILLIAMSON.

July 8, 1897.

The Midsummer Meeting was held, Mr. Langdon Brown, President, in the chair.

Dr. Norman Moore delivered his address on 'The Deaths of the Kings of England.' The meeting ended with a vote of thanks to Dr. Norman Moore, proposed by Dr. Maidlow, and seconded by Mr. Gladstone Clark.

October 7.

The address given at the opening of the Session was delivered by Mr. Langton, and was entitled 'Some of those after whom the Wards are named.' A vote of thanks was proposed by Mr. Meakin, and seconded by Mr. Drury.

Mr. J. Hussey, President, occupied the chair.

October 14.

An ordinary meeting, Mr. Langdon Brown, President, in the chair.

Mr. J. J. Grace read a paper on 'Empyemata of the Sinuses of the Nose.'

A short discussion followed.

October 21.

A clinical evening, Mr. Langdon Brown, President, in the chair.

Mr. Hussey showed two cases of coloboma iridis in the same family.

Dr. Morrison showed a case of supernumerary fingers and two thumbs on the right hand.

Mr. Horder showed a case of Addison's disease in a child of 7 years of age.

Mr. J. P. Maxwell exhibited excellent microscopical specimens of rodent ulcer and epithelioma of the scrotum.

Mr. Thursfield, on behalf of Mr. Briggs, showed a patient who had a pulsating orbital tumour with a distinct bruit.

Mr. J. L. Maxwell showed a case of congenital sacral tumour in an infant.

Mr. Emery showed a morbid anatomical specimen of carcinoma of the pylorus.

Dr. Morrison exhibited a specimen of placenta previa with a velamentous insertion.

October 28.

An ordinary meeting, Mr. Hussey, President, in the chair.

Mr. J. D. Rawlings read a paper on 'Some Diseases often Overlooked.'

A very brisk and useful discussion followed.

November 4.

An ordinary meeting, Mr. Hussey, President, in the chair.

Mr. T. P. Legg read a paper on 'Appendicitis.'

An interesting discussion followed.

November 11.

An ordinary meeting, Mr. Langdon Brown, President, in the chair.

Mr. Stawell read a paper on 'Perforating Gastric Ulcer.'

A long discussion followed.

November 18.

A clinical meeting, Mr. Hussey, President, in the chair.

Mr. Hussey gave a demonstration of the method of illuminating the stomach by means of an electric glow-lamp, introduced through the oesophagus.

Messrs. Horder, Drury, and Gilbert Smith showed cases.

Mr. Lance read notes on a case of 'Hydrophobia.'

Mr. Strangeways Pigg showed various morbid specimens.

November 25.

An ordinary meeting, Mr. W. Langdon Brown, President, in the chair.

Mr. Drury read a paper on 'Shortness of Breath.'

A discussion followed.

December 2.

An ordinary meeting, Mr. Langdon Brown, President, in the chair.

Dr. Morrison read a paper on 'Albuminuria in Pregnancy.'

An animated discussion followed.

December 9.

An ordinary meeting, Mr. Horder, Vice-President, in the chair.

Mr. F. C. Wallis read a paper on 'Some Points in the Diagnosis and Treatment of Psoas Abscess.'

January 13, 1898.

The Mid-Sessional Address was delivered by Dr. Lovell Drage, entitled 'The Coroner's Court.'

Mr. W. Langdon Brown, President, occupied the chair.

A vote of thanks, proposed by Mr. Phillips and seconded by Mr. Tucker, was carried with acclamation.

January 20.

An ordinary meeting, Mr. Hussey, President, in the chair.

Mr. Horder read a short paper on the subject of 'Hypnotism.'

An interesting discussion followed, in which Dr. Milne Bramwell spoke at some length.

January 27.

An ordinary meeting, Mr. Langdon Brown in the chair.

Dr. W. L. Rivers gave an address on 'Fatigue.'

A discussion followed.

February 3.

An ordinary meeting, Mr. Langdon Brown, President, in the chair.

Mr. Gladstone Clark read a paper on 'Extrauterine Gestation.'

A discussion followed.

February 10.

A clinical evening.

Mr. Horder showed a case of exaggerated reflexes with the interesting symptom of complete iridoplegia.

Mr. Drury showed a case of Erb's juvenile paralysis.

Dr. Kanthack showed specimens and drawings illustrating the origin of giant-cells in leprosy.

Dr. Emery showed some pathological specimens.

Mr. J. P. Maxwell made some remarks on vaccination.

February 17.

An ordinary meeting, Mr. Langdon Brown, President, in the chair.

Mr. Douglas read a paper on 'Lymphadenoma.'

An interesting discussion followed.

February 24.

An ordinary meeting, Mr. Horder, Vice-President, in the chair.

Dr. Emery read a paper on 'The Action of Tobacco.'

A discussion followed.

March 3.

An ordinary meeting, Mr. Langdon Brown, President, in the chair.

Dr. Robinson read a paper on 'Some Points of Interest Concerning Gonorrhœa in the Female.'

An interesting discussion followed.

March 10.

An ordinary meeting, Mr. Hussey, President, in the chair.

Mr. J. P. Maxwell read a paper on 'Pyuria.'

A discussion followed.

March 17.

The General Meeting, Mr. Langdon Brown, President, in the chair.

The report of the outgoing Committee and the balance-sheet were read and adopted.

The names of the officers elected for the ensuing year were as follows :—

Presidents—Messrs. T. J. Horder and H. Thursfield.

Vice-Presidents—Messrs. E. S. Hewer and T. Stawell.

Secretaries—Messrs. H. D. Everington and W. T. Rowe.

Additional Committee-men—Messrs. W. Morley Fletcher and F. C. Gröne.

DESCRIPTIVE LIST

OF

SPECIMENS REVISED AND ADDED
TO THE MUSEUM

DURING THE YEAR 1898.

SPECIMENS REVISED AND ADDED TO THE MUSEUM

During the Year ending September 30, 1898.

DESCRIBED BY

F. W. ANDREWES, M.D., AND H. MORLEY FLETCHER, M.D.

INTRODUCTORY REMARKS.

THE specimens which last year and the year before were prepared by the formalin and glycerin method have preserved their colour and characteristic appearances so well that no hesitation has been felt during the past year in employing this method as a matter of routine. It is indeed only in a few instances that specimens have been mounted in spirit. It has not therefore been felt necessary to indicate the mode of preparation after the description of each specimen.

A microscopic section of each specimen added has been placed in the Histological Records, wherever it was possible or desirable that this should be done.

A new departure has been made in the establishment of a "Student's Cabinet" of microscopic preparations illustrating medical and surgical pathology. A typical series of this kind has long been an urgent need, and there are already signs that it is a boon appreciated by the students. The Cabinet already contained 100 specimens, when it was enriched by the valuable present of upwards of 120 slides from Cambridge, presented by Professor A. A. Kanthack and Mr. Strangeways Pigg. Dr. Garrod has also kindly presented to it a collection of urinary crystals. It is intended to admit to this Cabinet only typical specimens of the best known pathological conditions, excluding mere rarities and curiosities, and to revise it from time to time, replacing existing specimens by better or more typical ones, when this is possible. It is readily accessible to students, and should be of considerable educational value.

No specimens have this year been rejected from the Museum, but thorough revision in this respect is very urgently and immediately needed,

if only to make room for the new specimens which are being added. A large number of these are merely better and more characteristic formalin specimens of conditions already represented, but which show poorly enough in the old spirit specimens on our shelves, and they might with advantage replace them.

A certain number of existing specimens in the Museum have been microscopically examined, where this had not previously been done, or where the diagnosis appeared doubtful. Two errors have thus been corrected, and will be found under the heading "Corrigenda."

The following is a Table of the specimens, added and re-mounted, and of the casts, photographs, drawings, and microscopic specimens added during the year:—

Old specimens re-mounted	110
New specimens added	105
Casts added	10
Photographs added	22
Drawings added	13
Microscopic specimens added	43

Two valuable presents have been received during the year, the sorting and description of which will take a considerable time, so that they cannot be entered in this year's Catalogue. The first is a large collection of calculi, presented by Sir Robert Craven of Hull, made by his father and himself, and enriched by additions from other surgeons in the same district. In this collection are many fine specimens, which will add to our existing series of calculi. The second is a collection of microscopic preparations made by the late Dr. Edward Palmer, Medical Superintendent of the County Asylum, Lincoln, and presented by his widow. The collection contains, amongst other specimens of interest, a large series of preparations illustrating morbid conditions of the brain.

The following is a list of the Donors whose names appear in this year's Catalogue:—

Dr. R. H. Bremridge.	George Heaton, Esq.	R. H. B. Nicholson, Esq.
H. T. Butlin, Esq.	Dr. W. Hunter.	D'Arcy Power, Esq.
Dr. J. H. Drysdale.	Robert Jones, Esq.	Dr. C. H. Roberts.
Dr. W. d'Este Emery.	Prof. A. A. Kanthack.	Surgeon-Major Wm. Sykes.
Dr. T. Graham Forbes.	C. B. Lockwood, Esq.	Miss Whittingham.
Dr. A. G. R. Foulerton.	H. B. Maingay, Esq.	T. H. Woodfield, Esq.

I.

CORRIGENDA.

CHONDRO-SARCOMA.

407. A Tumour involving the whole of the Superior Maxilla. The bone is much enlarged, and no trace of the original wall is left. The two incisors have been cut: a displaced capsule, which contained the cusps of two teeth, is seen on the posterior surface of the bone. Microscopic examination shows that the growth has a trabecular structure, like that of unossified cancellous bone. The trabeculae consist of very cellular hyaline cartilage, with myxo-sarcomatous tissue between.

Removed from an infant æt. 9 months. When three months old his mother noticed an enlargement of the gum: three months later the cheek began to swell, and continued to increase in size. The child made a good recovery from the operation.

A microscopic specimen is preserved in the *Histological Records*, i. 407.

See *Stanley Ward Book*, vol. vi. p. 433.

MYXO-SARCOMA.

3338. A Tumour springing from the soft structures of the Second Toe. As the section shows, the phalanges are only surrounded by, not involved in, the mass. Microscopically the growth is a typical myxo-sarcoma.

Removed by Pirogoff's amputation from a sailor æt. 45. Ten years before he had noticed soft, spongy, flattened papules about as big as split-peas, one on either side of the end of the toe. These gave him very little inconvenience, and grew very slowly till four months before his admission to the Hospital, when the disease began to grow quickly and became painful. In the fortnight preceding the amputation it encroached very rapidly on the soft parts of the dorsum of the foot as a soft, spongy, vascular mass, over which the skin was dusky, mottled, and streaked with distended veins.

A microscopic specimen of the growth is preserved in the *Histological Records*, l. 3338.

A drawing showing the specimen in the recent state is preserved in Series lvii. 1261.

II.

ADDENDA.

SERIES I.

DISEASES OF BONES.

ACUTE PERIOSTITIS AND OSTEOMYELITIS.

- 35a. A Longitudinal Section of a Left Femur, showing at its upper end the changes characteristic of acute infective periostitis and osteomyelitis. Over the anterior and lower part of the neck of the bone, and over part of the great trochanter, the periosteum is stripped off, leaving the bone bare. Between the bone and periosteum was a collection of pus, of which little trace now remains. On the cut surface the cancellous tissue of the upper part of the bone, including the epiphyses of the head and great trochanter, is seen to be infiltrated with pus, and the suppuration extends nearly half way down the shaft of the bone. Commencing foci of suppuration are seen in one or two places as paler areas in the medulla of the lower part of the shaft. With these exceptions, the lower half of the bone serves well for comparison with the upper half.

From a boy æt. 15, who died of pyæmia, after a very acute illness of fourteen days' duration. The primary lesion was probably that here shown in the neck of the femur, but the channel of infection was unknown. The infecting agent was *Staphylococcus pyogenes aureus*, associated with much smaller numbers of *Staphylococcus pyogenes albus*. These cocci were cultivated from the blood during life in great profusion. At the post-mortem a large number of secondary bone lesions were found, chiefly periosteal (tibia, ribs, phalanges, &c.). There was pus in the right knee-joint, many small pyæmic abscesses in the kidneys, and two in the heart muscle. Cultivations from various organs yielded the above cocci in large numbers. Part of the chest wall of this case is preserved in the following specimen.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 106; and *Male Medical Register*, vol. iii. (1898), No. 87.

ACUTE SUPPURATIVE PERIOSTITIS.

- 35b. Portion of the Chest Wall from the same case, showing acute suppurative periostitis. The shaft of one rib is laid bare for a distance of four inches, and is lying in a cavity which contained pus. The two ribs lying above it are affected to a lesser degree, showing purulent collections beneath the pleura.

For history and references see preceding case, 35a.

ACUTE OSTEOMYELITIS.

63b. A Section through the Lower End of the Femur, showing the changes characteristic of acute osteomyelitis. The epiphysis and the articular surface appear healthy. The diaphysis is injected and infiltrated with pus. Above, the surface where the shaft has been divided is coated with purulent lymph, and there are hæmorrhages in the tissues around the bone.

The specimen is from a case in which osteotomy was performed for genu valgum in a young person. Suppuration occurred in the wound, and extended to the cancellous tissue of the bone, but was arrested at the junction of the diaphysis and epiphysis.

Presented by Professor A. A. Kanthack.

ACROMEGALY.

74g. Skull-cap from a case of Acromegaly. It is very thick, dense and heavy, and the distinction between compact and cancellous tissue is largely lost. There is some heaping up of bone along the sutures, some of which are synostosed. There is a layer of porous periosteal new bone over part of the frontal area.

The patient was a man æt. 58, who stated that his symptoms (weakness, nervousness, enlargement of jaw, hands, and feet) had only been of 12 to 14 months' duration; but a photograph taken 19 years before showed a large and massive lower jaw. The case was a typical one of acromegaly. Death resulted from a railway accident. At the autopsy the sella turcica was found to be of great size, from absorption of the adjacent bone. The pituitary body was chiefly converted into a cyst containing a brownish semifluid substance, apparently from degeneration of an adenomatous growth or a simple hypertrophy.

See *Male Surgical Register*, vol. ii. (1894), No. 2998; and see *Transactions of the Pathological Society*, vol. xlix. (1898), p. 205, where the case and specimens are described at length.

Presented by P. Furnivall, Esq., F.R.C.S.

74h. Lower Jaw from the same case. It is deep and massive, with a projecting lower border. The angle is exceedingly obtuse, the rami continuing the curve of the body in a single sweep. The muscular prominences are well marked.

For references see under 74g.

74i. A Clavicle from the same case. Its curves are not well marked, but the muscular prominences are somewhat exaggerated.

For references see under 74g.

74k. The Hand and Wrist Bones of the same case. There is some exaggeration of the muscular ridges at the distal ends of the radius and ulna. The carpal and metacarpal bones are large, with well-marked ridges and prominences. On the phalanges the ridges for the vaginal ligaments are highly developed, and the width of the terminal phalanges is evidently increased by the development of osteophytic outgrowths.

For references see under 74g.

- 74l.** Bones of the Foot and Ankle from the same case. The changes above mentioned as seen in the hand are here repeated in lesser degree. Osteophytic outgrowths are present about the distal phalanges, especially in the hallux.

For references see under 74g.

- 74m.** Left Fifth Rib from the same case. It is unusually massive, and shows exaggeration of the muscular ridges and prominences, with osteophytic outgrowths.

For references see under 74g.

- 74n.** A Longitudinal Section of a Tibia from a case of Acromegaly. The whole bone is of large size, and the compact tissue of the shaft is thickened and dense. (It is doubtful, however, whether this may not be in part due to old rickets.) The cancellous tissue at the extremities of the bone is somewhat rarefied, and shows patches of hæmorrhage here and there in the marrow.

From a man æt. 52, who attended this Hospital in 1897 under the care of Dr. Herringham. He subsequently died in Charing Cross Hospital from cerebral hæmorrhage. The pituitary body was found to be enlarged and highly vascular; the sella turcica was not enlarged, but the bone around was red and vascular. The thyroid was enlarged, weighing $1\frac{1}{2}$ ounces. Increased vascularity and hæmorrhages were found in the marrow of various bones examined.

A photograph of this patient is preserved in Series lvii. No. 3c.

For complete details of the case see *Pathological Society's Transactions*, vol. xlix. (1898), p. 246.

Presented by Dr. William Hunter.

LEUKÆMIA.

- 295a.** A Vertical Section of a Tibia from a case of Spleno-medullary Leukæmia. The yellow marrow of the diaphysis has disappeared, and the cavity of the shaft is filled by a brownish-grey soft granular material, with indications of hæmorrhage here and there.

The spleen of this case is preserved in Series xxv. No. 2295g, and the mesentery in Series xxiv. No. 2277a.

For references see xxv. 2295g.

SERIES II.

DISEASES OF JOINTS.

ACUTE TRAUMATIC SYNOVITIS.

- 567c.** A Left Knee-Joint which has been laid open from the front, the patella being turned down. It shows acute traumatic synovitis, the result of a compound fracture of the upper end of the tibia into the joint; the external condyle of the femur is also fractured within the joint. The synovial membrane and other articular structures

are seen to be intensely injected. There is no attempt at repair of the fractures.

The patient was a girl *æt.* 20, who was run over in the street. Septicæmia supervened, and amputation was performed on the ninth day after the accident. The joint was found full of fluid and intensely inflamed, but no pus was present.

See *Female Surgical Register*, vol. v. (1897), No. 1866.

SARCOMA OF SYNOVIAL MEMBRANE.

569e. Part of a Recurrent Sarcoma, primary in the synovial membrane of the knee-joint, which was removed by operation. It is a firm, solid growth, slightly nodular on the surface. Microscopically it is a pure spindle-celled sarcoma.

The patient was a man *æt.* 26 years. The earliest symptom, pain and tenderness at the inner side of the left knee, was in 1890. In 1892 an exploratory operation revealed a sarcoma of the synovial membrane, not involving the bone. It was freely removed. Recurrences occurred locally, and were successively removed in March and October 1895, in September 1896, and October 1897. At the last operation, the tumour here preserved was removed; there was still no involvement of the bones, though ankylosis of the joint had occurred. Finally the leg was amputated in December 1897. The glands were unaffected.

A microscopic specimen of the growth is preserved in the *Histological Records*, ii. 569e.

See *Male Surgical Register*, vol. iv. (1897), No. 2758.

FIBROUS ANKYLOSIS FOLLOWING TUBERCULAR DISEASE.

639b. Section through Left Elbow-Joint of a boy *æt.* 11 years, showing fibrous ankylosis of the joint resulting from tubercular disease. Firm fibrous union is seen between the humerus and ulna.

For references see under Series xxviii. No. 2341i, where the kidney of the case is preserved.

CHARCOT'S DISEASE.

691f. A Vertical Section through a Right Knee-Joint showing the characteristic changes of Charcot's disease. The cavity of the joint has been packed before hardening, so as to maintain the appearance of distension; it can be seen that the joint contained a considerable quantity of fluid. The synovial membrane is moderately thickened, and shows slight fringed outgrowths which are most conspicuous at the back of the joint. All the internal ligaments of the joint are destroyed; no trace of them is visible. The articular surfaces of the bones exhibit the most important changes. Over the back of the patella, and at the anterior part of the articular end of the femur, the cartilage is irregularly pitted and shows nodular outgrowths; the latter are well seen at the edge of the patella. The central portion of the articular surface of the femur, and part of that of the tibia shows a shaggy condition of the cartilage, where this is fibrillated and being worn away. At the back of the femoral, and at the front of the tibial articular surfaces, the cartilage has vanished, and the bone itself is so worn away as completely to alter the shape of the ends of both bones entering into the formation of the joint. It is clear that during life the tibia had been displaced backwards, so that the main wear and tear came obliquely between the front of its articular surface

and the back of that of the femur. Below the patella is a transverse arch of bony tissue which is seen sawn through in the middle line; it appears to be of osteophytic origin. The cancellous tissue of the femur and tibia is somewhat rarefied.

The other half of this knee-joint has been macerated and prepared as a dry specimen (in Case G). See No. 691g.

From a man *æt.* 54, who had noticed for two years painless swelling of the joint. The pupils and knee-jerks were normal, nor were there any other indications of *tabes dorsalis*.

Presented by R. H. B. Nicholson, Esq.

691g. The Opposite Half of the same Knee-Joint as the preceding (691f), prepared as a dry specimen. It shows well the abundant osteophytic out-growths around the joint, the rarefaction and exposure of the cancellous tissue at the articular ends, and the great destruction of joint surface which has taken place in both femur and tibia. The changes extend for a distance of six inches above and below the joint.

For references see under No. 691f.

SERIES VI.

DISEASES AND INJURIES OF MUSCLES, TENDONS, AND BURSÆ.

ENLARGED BURSA PATELLÆ.

1214c. An Enlarged Bursa Patellæ. Its walls are half-an-inch in thickness. The cyst is occupied by young gelatinous connective tissue, in which spaces containing fluid are seen here and there; the semi-transparent mucoid character of the young connective tissue is well shown.

SERIES VII.

DISEASES OF THE PERICARDIUM AND HEART.

HÆMORRHAGIC PERICARDITIS.

1223a. A Heart showing the lesions of acute Hæmorrhagic Pericarditis. The heart is unopened: the parietal pericardium has been turned up, so as to display its inner surface. At the apex the two layers are adherent. Both layers of the pericardium are covered with a shaggy coat of blood-stained lymph.

From a girl *æt.* 13 years, the subject of chronic renal disease (contracting white kidney), with which the pericarditis was associated. The cavity of the pericardium contained half a pint of blood-stained fluid.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 38; and *Female Medical Register*, vol. i. (1898), No. 11.

DILATATION OF LEFT AURICLE.

1259b. A Heart showing enormous dilatation of the Left Auricle, associated with mitral disease. The left auricle is larger than the rest of the heart taken together, and is equal in size to two closed fists. Its walls are much thinned, and contain calcareous plates on the left side. The left appendix auriculæ is scarcely, if at all, dilated. The outer surface of the auricle is injected, and shows at its upper part the remains of fibrous adhesions, the result of localised pericarditis. The mitral valve is not appreciably stenosed, but the valve segments are thickened and puckered, and the chordæ tendineæ are thickened. The left ventricle is dilated and hypertrophied. The right auricle is moderately dilated, as is its appendix. There is marked hypertrophy of the right ventricle.

From a married woman æt. 27 years, who had been repeatedly under treatment for mitral disease at the Greenwich Infirmary for a period of nearly five years before her death. A year before death the heart's apex was in the 8th intercostal space, 2 inches outside the nipple-line. The action of the heart was irregular and tumultuous. There were loud presystolic and soft systolic bruits at the apex. Later, the apex beat reached the mid-axillary line; the heart's dulness reached up to the 3rd rib, and extended slightly to the right of the sternum; the double mitral bruit persisted. There was cyanosis, with much dyspnœa and œdema.

The report of the post-mortem examination states that, "on opening the thorax, the lungs were seen to be widely separated by the pericardium. On opening the latter, it appeared at first to be much too big for the heart, as though it had been greatly distended with fluid; but there was no abnormal fluid present. On raising the heart, the posterior surface of the pericardium was seen to be raised by what was apparently a large extravasation into the posterior mediastinum, but which afterwards proved to be the enormously distended left auricle, which had become doubled backwards, as it were, behind the rest of the heart. The auricle was entirely filled with recent clot. The mitral orifice easily admitted three fingers. The lungs were extremely emphysematous."

Presented by T. H. Woodfield, Esq.

ENDOCARDIAL HÆMORRHAGES.

1363a. Portion of a Heart showing hæmorrhages beneath the endocardium of the left ventricle, on the interventricular septum.

From a man æt. 34 years, who died of an aneurysm of the abdominal aorta, which ruptured behind the peritoneum. The heart weighed 11 ounces, and was otherwise natural. The hæmorrhages were confined to the left ventricle.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 291.

SERIES VIII.

DISEASES AND INJURIES OF ARTERIES.

MULTIPLE ANEURYSMS OF AORTA.

1484b. Heart, Thoracic Aorta, and Great Vessels, showing a condition of extreme atheroma of the aorta, with three independent aneurysms. The aorta shows general dilatation, and its walls are rugged from ulceration and calcareous deposit. The first aneurysm is about as large as a walnut,

and occupies one sinus of Valsalva; it is completely filled with hard, laminated clot, and has apparently undergone a natural process of cure. It has so encroached on the heart muscle as to bulge into the right auricle. The second aneurysm, as large as a cricket-ball, is given off close to the origin of the innominate artery, and involves that trunk. It has eroded the first and second ribs on the right, and the sternal end of the left clavicle—these structures forming part of the wall of the sac. The sac contains only a small quantity of laminated clot at its left and posterior part. The third aneurysm is as big as a racquet-ball, and is given off from the descending part of the arch about an inch below the left subclavian artery. It has a fairly wide mouth, and is about half filled with laminated clot. Looking at the specimen from behind, it is seen that this sac is displacing and compressing the œsophagus.

From a man æt. 45 years. The innominate aneurysm was known to have been of two years' duration. There was a history of alcohol. Death occurred suddenly from heart failure.

Presented by T. Graham Forbes, M.B.

LAMINATED BLOOD CLOT FROM ANEURYSM.

1548b. A Section of a Mass of Laminated Clot removed post-mortem from a large intrathoracic aneurysm. The greater part of the clot is decolorised, and shows a very distinct laminated structure. The central portion, bounding the canal through which blood still flowed during life, is dark in colour and soft in consistency, and evidently much more recent.

Presented by Dr. J. H. Drysdale.

SERIES X.

DISEASES AND INJURIES OF THE LARYNX AND TRACHEA.

ŒDEMA OF LARYNX.

1615b. Section through the Larynx, showing extensive œdema of the epiglottis, aryteno-epiglottidean folds, and adjacent parts. The extent of the swelling is best shown in the section through the epiglottis, on the upper surface of which the mucous membrane is seen to attain nearly a quarter of an inch in thickness, and to be of semi-translucent aspect.

From a man æt. 57 years, a heavy drinker, who died after twenty-four hours' illness. He was admitted to the Hospital with urgent dyspnoea, but died a few hours later in spite of tracheotomy. Cultivations from the larynx yielded streptococci; those from the spleen were sterile.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 53; and *Male Medical Register*, vol. v. (1898), No. 63.

SERIES XI.

DISEASES AND INJURIES OF THE PLEURA, BRONCHIAL TUBES, AND LUNGS.

CHRONIC PHTHISIS.

1669a. Section through a Left Lung, showing the results of old tubercular disease. The pleura is greatly thickened, and there is much shrinking and fibroid change in the lung. In the upper lobe is a large smooth-walled quiescent cavity, with prominent vessels on its walls: a smaller cavity lies above it, and there is another in the lower lobe. The bronchi are thickened, closely packed from shrinkage of the lung, and somewhat dilated. No recent tubercle can be detected.

From a man *æt.* 30 years, who died of chronic phthisis (of about four years' duration), with lardaceous disease. There was recent active tubercle in the right lung, with a small cavity at the apex. The left lung, shown in the specimen, was much shrunk, and was not visible on opening the thorax: the pleura was universally and densely adherent.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 55; and *Male Medical Register*, vol. i. (1898), No. 10.

GLANDERS DEPOSIT IN PLEURA.

1678f. Portion of the Ribs and Parietal Pleura from a case of Glanders, in which the lungs were extensively affected. Beneath the pleura is a yellowish deposit, some quarter of an inch in diameter, the pleura being thickened and injected around, with a little recent lymph on its surface.

For the history and references see Series xi. No. 1712a.

SECONDARY CARCINOMA OF PLEURA.

1678g. Portion of a Lung, showing secondary cancerous growths on the pleura, spreading apparently by the pleural lymphatics. The growths are small and whitish in colour: the lung itself is not invaded. The growth, like the primary one in the breast, is a carcinoma of columnar-celled type.

From a woman *æt.* 50 years, who suffered from a small atrophic cancer of the breast. Secondary growths were found in the axillary and cervical glands, parietal and visceral pleuræ, diaphragm and liver.

A microscopic specimen is preserved in the *Histological Records*, xi. 1678g.

See *Surgical Post-Mortem Register*, (1898), p. 88; and *Female Surgical Register*, vol. iv. (1898), No. 930.

ACUTE EMPHYSEMA.

1696c. Portion of the Lung of a Child, showing acute emphysema with patches of collapse. On close inspection the over-distended air vesicles can be seen under the pleura, giving a glistening appearance to the surface. The collapsed areas are sharply defined, and of a dark plum colour. There are indications of broncho-pneumonia on the cut surface.

From a child *æt.* 5½ years, who died of broncho-pneumonia.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 1.

SEPTIC PNEUMONIA.

- 1702b.** Section of the Lower Lobe of a Lung, showing the characteristic appearances of aspiration-pneumonia. The lung is consolidated and shows numerous greyish-white foci, confluent in places, but nowhere breaking down. At the extreme lower margin of the lung small radiating whitish patches are seen, representing pus aspirated into minute bronchioles. The pleura shows a partial covering of reddish lymph. Microscopically the lung showed purulent broncho-pneumonia.

From a woman æt. 29 years, who died of epithelioma of the œsophagus, which had ulcerated through into the trachea. Tracheotomy had been performed.

See *Surgical Post-Mortem Register*, (1898), p. 30; and *Female Surgical Register*, vol. iv. (1898), No. 1675.

A microscopical specimen is preserved in the *Histological Records*, xi. 1702b.

GLANDERS.

- 1712a.** A Human Lung showing the characteristic lesions of glanders. It is intensely engorged, and shows numerous yellowish-white areas—the “glanders nodules”—best seen on the cut surface, but visible also beneath the pleura. The nodules vary in size up to half an inch in diameter, and are irregular in shape. They are firm and hard, and show no sign of caseation or breaking down; round each a narrow zone of intense vascular congestion can be seen. There is a little recent lymph on the pleura. Both lungs were similarly affected. The glanders bacillus (*B. mallei*) was readily demonstrated in the nodules, and cultures were obtained.

From a man æt. 37 years, who had contracted syphilis sixteen years before his death. Ten days before admission his left eyelid swelled; it grew worse, and an inflammatory condition resembling erysipelas spread over the face. On admission, there were pustules over the nose, and there was great constitutional disturbance. The skin of the nose became gangrenous, and there was discharge from the nostrils. The patient died four days after admission. No source of infection could be traced.

The nose and adjacent parts from this case are preserved in Series xii. No. 1763c, and a portion of the pleura in 1678f.

Microscopic sections of the lung are preserved in the *Histological Records*, xi. 1712a.

See *Surgical Post-Mortem Register*, (1897), p. 239; *Male Surgical Register*, vol. iv. (1897), No. 2991; and *Transactions of the Pathological Society*, vol. xlix. (1898), p. 20.

TUBERCULAR BRONCHO-PNEUMONIA.

- 1724e.** Section through the Left Lung of a Child showing tubercular broncho-pneumonia with early cavities. The lung is completely solid except at the extreme base. Both lobes are affected, and almost equally so; at the apex the process is less advanced than lower down. There are caseous patches here and there, which have begun to break down into irregular cavities.

From a child æt. 1 year and 8 months, who died of general tuberculosis, with tubercular cerebral tumours.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 295; and *Female Medical Register*, vol. iii. (1897), No. 122.

HÆMORRHAGE INTO A TUBERCULAR CAVITY.

1725b. Section through the Upper Portion of a Right Lung showing two large phthysical cavities. The apical cavity is empty, and lined with a smooth thick membrane. The lower one is completely filled by firm, laminated blood clot. The whole upper lobe is consolidated, and miliary tubercles are seen elsewhere in the lung.

From a man æt. 31 years, who died of phthisis after an illness of three years' duration. Five weeks before his death he was admitted to the Hospital for hæmoptysis of eighteen days' duration; the hæmorrhage gradually decreased, and was very slight at the time of death.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 311; and *Male Medical Register*, vol. v. (1897), No. 200.

CARCINOMA OF ROOT OF LUNG.

1729c. Section through the Mediastinum and Left Lung, showing the extension of a carcinoma which originated about the root of the lung, probably in the bronchus.

On the front surface of the specimen, the root of the lung is seen to be occupied by a mass of whitish new growth, which is invading the lung along the bronchi. The lower lobe of the lung is airless, and is breaking down in places. The pleura is infiltrated with new growth, and is enormously thickened; it was universally adherent. At the apex and the base are small loculated cavities which contained pus. The pericardium is seen to be invaded in the neighbourhood of the pulmonary artery and left pulmonary veins; its cavity contained blood-stained fluid. The aorta is not narrowed, although the arch is completely surrounded by new growth. Numerous lymphatic glands are seen enlarged and infiltrated.

On the posterior surface of the specimen the trachea is laid open; its walls are infiltrated, and it is embedded in massive new growth; there is some ulceration of its mucous membrane. The orifice of the left bronchus is narrowed to a mere slit; the right bronchus is unaffected. The anterior wall of the œsophagus is bulged by an enlarged gland, narrowing the lumen, but the mucous membrane is intact. The descending aorta is accompanied by a chain of enlarged glands, but is not narrowed. The pleura posteriorly shows the impressions of the ribs very plainly.

Microscopically the growth is a spheroidal-celled carcinoma.

From a man æt. 24 years. The duration of his illness was between four and five months.

A microscopic specimen is preserved in the *Histological Records*, xi. 1729c.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 236; and *Male Medical Register*, vol. iv. (1897), No. 209.

SERIES XII.

DISEASES AND INJURIES OF THE NOSE, MOUTH,
TONGUE, PALATE, AND FAUCES.**EMPHYEMA OF ANTRUM.**

1774c. The Right Superior Maxilla of an Infant, extensively necrosed. The orbital and facial surfaces are largely destroyed, and the malar surface is represented by two sequestra (suspended beneath the specimen) exposing the milk molars.

From an infant æt. 8 weeks, whose face was damaged at birth by forceps delivery.

For full description and clinical history see *Transactions of the Pathological Society*, vol. xlix. (1898), p. 200; and the *British Medical Journal*, vol. i. (1898), p. 368.

Presented by D'Arcy Power, Esq., F.R.C.S.

GLANDERS.

1763c. Upper Jaw, Nose, Septum, and adjacent parts from a case of human glanders. Certain of the lesions shown probably depend upon tertiary syphilis, from which the patient also suffered. Externally the nose and upper lip show extensive ulceration and scabbing, giving the surface a blackened and eroded appearance. The ulceration extends into the nostrils, and is seen on the septum nasi. The latter is perforated behind, probably as the result of syphilis, and part of the necrosed vomer lies in the perforation. The mucous membrane on the septum shows several yellowish-white glanders nodules, and the left antrum, which has been laid open, presents similar appearances. It would appear that in this case recent glanders lesions have been superposed on old lesions of tertiary syphilis.

For the references to this case see under Series xi. No. 1712a, where the lung is preserved.

SERIES XV.

DISEASES AND INJURIES OF PHARYNX AND
ŒSOPHAGUS.**DIPHTHERIA.**

1837c. Fauces and Larynx from a case of Diphtheria. The larynx has been opened from behind. The tonsils are much enlarged, ulcerated, and covered with thick greenish-grey membrane, which extends back to the lateral walls of the pharynx. The epiglottis is deeply congested, and shows patches of membrane on its laryngeal surface. Both epiglottis and arytenoids are swollen and œdematous. Irregular patches of membrane are seen also at the upper part of the trachea in the neighbourhood of a tracheotomy incision.

PEDUNCULATED SARCOMA OF PHARYNX.

1842a. Larynx, Pharynx, and adjacent parts, showing a pedunculated tumour arising from the posterior pharyngeal wall, and obstructing the upper opening of the larynx. The pharynx has been laid open from behind, fully exposing the tumour, but leaving its base of attachment untouched. The œsophagus is laid open by a longitudinal window, and a coloured glass rod, obliquely inserted into it, passes into the pharynx above, to the right of the tumour. The tumour springs from the middle line of the posterior wall of the pharynx at the level of the arytenoid cartilages. It is about the size of a horse-chestnut and is somewhat lobulated; when fresh it measured 35 by 27 by 20 m.m. in its various diameters. The flattened pedicle consists of pharyngeal mucous membrane. During life the growth evidently lay in large part within the upper opening of the larynx. Its surface is somewhat ulcerated. Microscopically it proved to be a sarcoma. The larynx is rather widened transversely, but is otherwise natural.

From a man æt. 54 years, who had suffered for nine months from intermittent dyspnœa and dysphagia of increasing severity. A week after his admission to the Hospital, a sudden attack of dyspnœa necessitated tracheotomy. The further operation of thyrotomy was contemplated for the removal of the growth, but the patient died under anæsthesia.

See *Surgical Post-Mortem Register*, (1897), p. 195; and *Male Surgical Register*, vol. v. (1897), No. 2478.

A section of the tumour is preserved in the *Histological Records*, xv. 1842a.

CARCINOMA OF PHARYNX.

1843b. Malignant Disease of the Pharynx and uppermost part of the Esophagus. The growth chiefly involves the pharynx, especially its right side. Below it extends to the level of the third ring of the trachea; above it reaches the aryteno-epiglottidean folds, but it has not invaded the larynx. The surface is ulcerated. Microscopically the growth is a squamous-celled carcinoma.

From a man æt. 57 years. The duration of symptoms was nine months.

There were no secondary growths, with the exception of some infiltration of the glands of the neck.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 203; and *Male Medical Register*, vol. i. (1897), No. 185.

EPITHELIOMA OF ŒSOPHAGUS ULCERATING INTO AORTA.

1844c. A Specimen of Epithelioma of the Esophagus which caused death by ulcerating into the aorta. The growth begins five inches below the crico-arytenoid folds, and the long diameter of the ulcer is three inches. It is opposite the bifurcation of the trachea, and nearly encircles the œsophagus. Its edges are nodular. From its left side a narrow channel, through which a small glass rod has been passed, leads into the descending part of the aortic arch. The lumen of the œsophagus is not much narrowed, and the growth has not invaded any other adjoining structures, nor were any secondary growths found. Microscopically the growth is a squamous carcinoma.

From a man of about 60 years of age, who came to the Hospital for slight hæmoptysis, and died half an hour after admission. The total amount of blood

brought up was only a few ounces. He had experienced slight difficulty in swallowing for some time. Post-mortem the stomach was found distended with blood clot.

A microscopic specimen of the growth is preserved in the *Histological Records*, xv. 1844c.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 65; *Male Medical Register*, vol. v. (1898), No. 836; and *Transactions of the Pathological Society*, vol. xlix. (1898), p. 92.

RUPTURED VARICOSE VEIN OF ŒSOPHAGUS.

- 1857b.** The Lower Part of the Œsophagus, from a case of cirrhosis of the liver. Numerous contorted varicose veins are seen running longitudinally, more marked below, and ceasing above at about the level of the bifurcation of the trachea. About half an inch from the stomach one of these varices has ruptured, and led to fatal hæmorrhage; a small clot is seen projecting from the orifice.

From a man æt. 43 years, who died of hæmatemesis.

See also specimen No. 2511c in Series xxx.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 242.

SERIES XVII.

DISEASES AND INJURIES OF THE STOMACH.

SUBMUCOUS HÆMORRHAGES.

- 1918d.** A Stomach which has been turned inside out so as to display hæmorrhages into the mucous membrane. The hæmorrhages are situated chiefly on the anterior wall and greater curvature. They are small, roughly circular, and tend to become confluent over the greater curvature. In the centre of each is a distinct erosion with a greyish base, probably a secondary change due to digestion of the injured areas. Towards the pylorus is a large annular patch of erosion which appears to have had a similar origin.

From a man æt. 21 years, who was admitted to the Hospital, after three days' illness, with symptoms pointing to intestinal obstruction. He died a few hours after an exploratory laparotomy, and at the autopsy signs of acute septicæmia were found with intense localised enteritis. There were hæmorrhages not only into the stomach, but into the skin and serous membranes.

See *Surgical Post-Mortem Register*, (1897), p. 215; and *Male Surgical Register*, vol. v. (1897), No. 2853.

CARCINOMA OF PYLORUS.

- 1923b.** Longitudinal Section of a Stomach, showing dilatation due to a malignant stricture of the pylorus. The growth, which is a spheroidal-celled carcinoma, is limited to the pylorus. The stomach-wall is much stretched and thinned by dilatation.

From a man æt. 48 years, who had suffered from vomiting for six months. There was no pain, but a freely movable swelling was felt in the epigastrium.

See *Surgical Post-Mortem Register*, (1898), p. 21; and *Male Surgical Register*, vol. iii. (1898), No. 3433.

A microscopic specimen is preserved in the *Histological Records*, xvii. 1923b.

SERIES XVIII.

DISEASES AND INJURIES OF THE INTESTINES.

HÆMORRHAGIC EROSION OF DUODENUM.

1956f. Pyloric end of Stomach and part of the Duodenum, from a case of extreme systemic venous congestion, due to failure of the right heart. The duodenum shows the condition known as hæmorrhagic erosion. There are four or five small superficial ulcers, the surfaces of which are blackened by the presence of altered blood.

From a man æt. 42 years, the subject of chronic emphysema and dilated heart. See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 321.

HÆMORRHAGIC INFARCTION.

1956g. A Portion of the Jejunum, showing hæmorrhagic infarction due to thrombosis of the superior mesenteric vein associated with cirrhosis of the liver. The gut is enormously thickened and brawny, and of a deep purple colour; the valvulæ conniventes are thickened and prominent, and there is some superficial ulceration. The lumen was full of blood. The region affected was situated five feet below the end of the duodenum, and was some nine inches in length, with a small outlying patch of infarction seen at the lower end of the specimen. The hæmorrhagic discoloration is well seen on the serous surface of the gut: the corresponding area of mesentery was thickened, brawny, and discoloured. The great thickening of the intestinal wall is best seen at the cut edge of the gut.

The patient was a very stout man, æt. 48 years, with a history of free spirit-drinking. Two years before death he had severe hæmatemesis. Five days before death he was seized with abdominal pain, distension, and constipation, but no vomiting. Death was preceded by copious hæmatemesis. Post-mortem the liver was found in a condition of extreme cirrhosis, and weighed 79 ounces. The main trunk of the portal vein contained adherent pale thrombus, not completely obstructing its lumen; this thrombus extended into the splenic and superior mesenteric veins, but did not quite block them. A branch of the superior mesenteric vein, however—that corresponding to the section of jejunum here preserved—was found completely blocked by more recent clot, extending to its finest ramifications.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 146.

SIMPLE ULCERATION OF INTESTINE.

1963c. Portion of the Small Intestine of an infant, showing the condition known as “simple” or “follicular” ulceration. The ulcers are numerous, small, rounded, sharply punched out, and have thickened margins.

From an infant which died of marasmus.

Presented by Professor A. A. Kanthack.

TUBERCULOSIS OF INTESTINE.

2012f. A Portion of the Ileum affected by tubercular disease, seen from its serous surface. The disease extends round the gut for more than half

its circumference. The gut is slightly narrowed, and the tubercular process is seen to have extended transversely to the long axis of the intestine. Numerous miliary tubercles are seen on the peritoneal surface, and some are well seen on the lymphatics running from the affected part.

From a patient æt. 31 years, who had extensive pulmonary tuberculosis.
See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 7.

LIPOMA OF DUODENUM.

2019d¹. A Portion of the Second Part of the Duodenum, showing a sub-mucous lipoma. The tumour is 23 mm. in length and 16 mm. broad. It is of a pale yellow colour, and is attached by a flattened pedicle of mucous membrane 11 mm. in breadth.

The specimen was discovered accidentally post-mortem.
See *Surgical Post-Mortem Register*, (1898), p. 115.

CARCINOMATOUS STRICTURE OF COLON.

2027k. Portion of the Sigmoid Flexure of the Colon, showing an extremely localised malignant growth, almost completely obstructing its lumen. The total length of the growth is one inch. Externally there is seen a marked annular constriction. Internally the growth has fungated to such an extent that a probe could scarcely be passed along the channel. Microscopically the growth is a cylindrical-celled carcinoma.

Removed by operation from a woman æt. 65 years, who was admitted with symptoms of intestinal obstruction of fourteen days' duration, but for two months she had suffered from abdominal pain and swelling. Inguinal colotomy was successfully performed. Two weeks later the growth here shown was removed, and the patient made a good recovery.

A microscopic specimen is preserved in the *Histological Records*, xviii. 2027k.
See *Female Surgical Register*, vol. v. (1898), No. 650.

CYSTIC DILATATION OF APPENDIX VERMIFORMIS.

2036b. A Vermiform Appendix, which has undergone cystic dilatation as the result of obliteration of its lumen near the cæcal end. It formed, in the fresh state, a tense semi-translucent sausage-shaped cyst, attached to the cæcum by a short narrow neck, and filled by clear mucus. Its peritoneal attachment is thickened by the deposit of fat, and extends to the tip of the organ.

The specimen was met with accidentally in the performance of laparotomy on a young woman for extrauterine gestation. It had caused no symptoms.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 106.

Presented by Alexander G. R. Foulerton, Esq.

SERIES XX.

HERNIÆ, OR PROTRUSIONS AND OTHER DIS- PLACEMENTS OF THE INTESTINAL CANAL OR OMENTUM.

CONGENITAL DIAPHRAGMATIC HERNIA.

- 2163d. Part of the Thorax and Abdomen of a Fœtus, showing on the left side, and towards the posterior part of the diaphragm, a congenital diaphragmatic hernia, containing the spleen and a portion of the stomach.

The fœtus exhibited also an umbilical hernia.

INTUSSUSCEPTION.

- 2182b. The Abdominal Viscera of an Infant, preserved *in situ*, with the bony parts of the abdominal walls, showing an undisturbed intussusception of the variety known as ileo-ileaco-cæcal. The intussusception lies wholly on the right side of the abdomen. Invagination commences several inches above the ileo-cæcal valve, and the portion of ileum which lies between this and the valve is much puckered. The vermiform appendix can be seen marking the position of the valve. The intussusception extends within the colon as far as, or a little beyond, the hepatic flexure. Below this the large intestine can be seen empty and collapsed. There is no peritonitis, and all the other viscera are normal.

From an infant æt. 7 months, who died an hour after admission to the Hospital before any operation could be performed. Symptoms were of four days' duration.

See *Surgical Post-Mortem Register*, (1897), p. 275; and *Female Surgical Register*, vol. v. (1897), No. 2561.

SERIES XXI.

DISEASES AND INJURIES OF THE LIVER.

SYPHILITIC CIRRHOSIS.

- 2198d. A Portion of a Liver, showing an advanced degree of cirrhosis, due to congenital syphilis. The surface of the organ is very coarsely nodular, and shows the remains of numerous adhesions which united it to the diaphragm and adjacent structures. The nodules are much larger than in ordinary alcoholic cirrhosis. The cut surface shows that the hepatic tissue is intersected everywhere by bands of firm white fibrous tissue, dividing it up into large islands, which are again intersected by finer fibrous trabeculæ. No gummata are present. The liver weighed 32 ounces,

and is evidently much contracted. Its edge is somewhat rounded, and the capsule is thickened, but only to a slight degree.

From a girl *æt.* 12 years, with well-marked Hutchinson's teeth. She had suffered for some time with ascites, and died of hæmatemesis, the result of a ruptured varix at the cardiac orifice of the stomach. The spleen was enlarged and hard, and showed perisplenitis. There was no reason to doubt the syphilitic origin of the liver affection.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 262; and *Female Medical Register*, vol. iii. (1897), No. 119.

GUMMATA OF LIVER.

2202d. Portion of a Liver, showing recent gummata. The organ weighed 86 ounces, and contained two large irregular gummatous masses, of which one is shown in this specimen, besides numerous smaller nodules. There is some perihepatitis, and some commencing contraction around the gumma.

From a man *æt.* 23 years, who died of ascites. The spleen, showing similar gummata, is preserved in Series xxv. No. 2299a.

A microscopic specimen is preserved in the *Histological Records*, xxi. 2202d.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), No. 320; and *Male Medical Register*, vol. iv. (1897), No. 255.

CONGENITAL SARCOMA OF LIVER.

2215d. Portion of the Liver of an Infant, showing almost complete replacement of the liver tissue by sarcomatous growth. The organ is much enlarged, but maintains its ordinary shape; the surface is smooth, and gives little indication of the change within. The cut surface shows almost universal infiltration with whitish new growth. The dark areas on the cut surface represent the remains of the liver tissue. Microscopically the growth is a small round-celled sarcoma.

From an infant *æt.* 8 weeks. The abdomen was unduly prominent at birth, and there was a tumour having the characters of an enlarged liver. There was no jaundice or ascites. The liver weighed 49 ounces. A small nodule in one suprarenal was apparently a secondary growth. No other organs were affected.

See *Histological Records*, xxi. 2215d.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 137.

Presented by G. Heaton, Esq., F.R.C.S.

SARCOMATOUS CYSTS OF LIVER.

2215e. Portion of a Liver, from a case of widely-distributed sarcomatous growth, showing the formation of cysts by the breaking down of secondary nodules. Several cysts are seen on the cut surfaces, varying in size from that of a pea upwards: the largest is more than 2 inches in length by 1 inch in breadth. Each is surrounded by an indistinct capsule, and the walls show ragged remains of hæmorrhagic growth adhering to them. Here and there are small whitish nodules of growth which have not broken down: one of these is in contact with a good-sized cyst. In the fresh condition the cysts were filled with broken-down, dark material looking like blood-clot. Microscopically the walls of the cyst show a scanty, ragged sarcomatous fringe.

From a woman *æt.* 49 years. Eleven months before death the primary growth appeared in the skin of the back; it was removed six months later, and was

found to be a sarcoma. The axillary glands were early affected, and at the autopsy the cervical and axillary glands were found infiltrated, and there were secondary growths in the pleuræ, lungs, liver, and bones.

See *Histological Records*, xxi. 2215d.

See *Surgical Post-Mortem Register*, (1897), p. 261; and *Female Surgical Register*, vol. iii. (1897), No. 1286.

SECONDARY MALIGNANT DISEASE OF LIVER.

- 2216g. A Portion of a Liver and Gall-Bladder, showing a secondary nodule of malignant disease, which probably began in the edge of the liver, and has compressed the fundus of the gall-bladder before it. The peritoneal covering of the gall-bladder is continued on to the tumour, so that from the outside the growth appeared to be in the wall of the gall-bladder. The section shows, however, that this is not the case. Microscopically the growth is apparently a round-celled sarcoma.

From a man æt. 28 years, who died of malignant disease of the lung. There was only one other secondary mass in the liver, and several in the pancreas and kidneys.

A section of the growth is preserved in the *Histological Records*, xxi. 2216g.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 156; and *Male Medical Register*, vol. v. (1897), No. 92.

LYMPHADENOMA OF LIVER.

- 2223a. A Portion of the Liver from a case of Hodgkin's disease in a child. The surface shows a number of prominent whitish lymphadenomatous nodules of various sizes. It also shows pittings and other minor irregularities. The section shows one or two lymphadenomatous areas near the capsule. Microscopically the nodules are typical lymphadenoma.

From a boy æt. 4 $\frac{3}{4}$ years.

A portion of the spleen is preserved in Series xxv. No. 2305c, under which heading the clinical notes and references will be found.

A section of the liver is preserved in the *Histological Records*, xxi. 2223a.

NÆVUS OF LIVER.

- 2224b. A Section through the Liver, exhibiting a large nævus close to the under surface of the organ. The cavernous structure is well shown.

A microscopic specimen is preserved in the *Histological Records*, xxi. 2224b.

Presented by Professor Kanthack.

SERIES XXIV.

DISEASES OF THE LYMPHATIC GLANDS AND VESSELS.

LEUKÆMIA.

- 2277a. The Mesentery of a case of spleno-medullary leukæmia, showing a moderate and uniform enlargement of the lymphatic glands.

The spleen is preserved in Series xxv. No. 2295g, and a section of the tibia in Series i. No. 295a.

A section of one of the lymphatic glands is preserved in the *Histological Records*, xxiv. 2277a.

For references see Series xxv. No. 2295g.

MELANOTIC SARCOMA.

- 2294a.** A Mass of Lymphatic Glands from the Axilla, showing secondary deposition of melanotic sarcoma. Hæmorrhage has occurred into the mass here and there.

Removed by operation from a woman æt. 66 years.

See *Female Surgical Register*, vol. ii. (1897), No. 2236.

- 2294b.** Another Group of Axillary Glands from the same case as 2294a, showing a larger hæmorrhage.

For reference, see preceding specimen.

SERIES XXV.

DISEASES AND INJURIES OF THE SPLEEN.

LEUKÆMIA.

- 2295g.** A Portion of the Spleen from a case of spleno-medullary leukæmia. The organ weighed 96 ounces. The capsule is thickened and shows pitting; the remains of adhesions are seen here and there. The section is of a uniform chocolate red colour, and shows no trace of the Malpighian bodies. On the convex surface of the organ is a large necrotic infarct of a bright yellow tint, surrounded by a narrow zone of hæmorrhage, the surface over which is a little depressed.

From a man æt. 47 years, who presented the typical characters of spleno-medullary leukæmia. The blood-count a month before death showed 119,700 leucocytes and 2,601,000 red corpuscles per cubic mm. There were many nucleated red corpuscles, many myelocytes, but few eosinophil cells. The duration of the disease was thirteen months.

A specimen of the mesenteric glands from this case is preserved in Series xxiv. No. 2277a, and a section of the tibia in Series i. No. 295a.

Microscopical sections of the spleen, liver, and lymphatic glands are preserved in the *Histological Records*, Series xxv. 2295g and 2277a.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 145; and *Male Medical Register*, vol. iii. (1898), No. 81.

HÆMORRHAGE INTO SPLEEN.

- 2295h.** Portion of a Spleen from a case of infective endocarditis, showing hæmorrhage into the substance of the organ. The spleen is much enlarged; it weighed 41 ounces. At the upper end is a roundish area of hæmorrhage as large as a small orange, not having the shape or aspect of an ordinary infarct. The blood clot is distinctly laminated. Adjacent to it are a few smaller hæmorrhagic patches.

From a man æt. 46 years, who died of streptococcus endocarditis of the aortic valves; he had also cirrhosis of the liver. No infarcts or hæmorrhages were found in any other organ.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 304; and *Male Medical Register*, vol. i. (1896), No. 66 and 66a.

GUMMATA OF SPLEEN.

2299. Portion of a Spleen showing recent gummata. The organ weighed 35 ounces, and contained several gummatous masses, one of the largest of which is seen at one corner of this specimen, as well as some smaller ones on the cut surface. Near the large gumma there is thickening of the capsule. There was no lardaceous reaction with iodine.

From a man æt. 23 years.

The liver, showing gummata, is preserved in Series xxi. No. 2202d.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 320; and *Male Medical Register*, vol. iv. (1897), No. 255.

A microscopic specimen is preserved in the *Histological Records*, xxv. 2299.

CALCAREOUS MASSES IN SPLEEN.

2299b. Section of a Spleen showing a calcareous mass enclosed in a fibrous capsule. Two smaller patches of a similar nature are also visible. The spleen was not enlarged, and contained half-a-dozen calcareous masses, of which that shown in the specimen is the largest. They are possibly of tubercular origin.

From a man æt. 42 years, who died of compound fracture of the skull. The other viscera were normal.

See *Surgical Post-Mortem Register*, (1897), p. 108.

MILIARY TUBERCLE OF SPLEEN.

2301d. A Spleen containing a very large number of miliary tubercles, which are well seen on the surface of the organ; a few are situated in the capsule itself. The organ is considerably enlarged.

From a male child æt. 15 months, who died of tubercular meningitis; there was acute general tuberculosis.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 82.

LYMPHADENOMA.

2305b. Portion of a Spleen from a case of Hodgkin's disease. The organ is enlarged; it weighed 9 ounces. On the surface are seen nodular enlargements, not lighter in colour than the rest of the organ. There are the remains of adhesions on the concave surface. The section shows numerous small irregular whitish nodules, from the size of a pin's head up to that of a pea. Here and there a few small patches of hæmorrhage can be seen.

From a boy æt. 12 years, who died after an illness of 8½ weeks' duration, characterised by cough, wasting, weakness, and anæmia. He died on the fourth day after admission to the Hospital. Post-mortem there was general enlargement of the lymphatic glands. The marrow of the sternum, lumbar vertebræ, and femur was almost white. The liver was pale and very fatty.

A microscopic specimen of the spleen is preserved in the *Histological Records*, xxv. 2305b.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 280; and *Male Medical Register*, vol. iv. (1897), No. 254.

2305c. Portion of a Spleen from another case of Hodgkin's disease. (Compare with the preceding specimen.) The organ is much enlarged, and has the characteristic "hard-bake" appearance. A few whitish

nodules are seen on the surface. On the section there are very numerous yellowish-white areas, none of any considerable size.

From a boy æt. 4½ years. The cervical glands were enlarged two years before death. On admission, eighteen days before death, there was enlargement of the lymphatic glands generally, and the spleen and liver were notably enlarged. A fortnight before death a blood-count gave the following results :—Hæmoglobin, 28 per cent.; red corpuscles, 1,900,000; leucocytes, 9000 per cubic mm.

A portion of the liver is preserved in Series xxi. No. 2223a.

A microscopic specimen of the spleen is preserved in the *Histological Records*, xxv. 2305c.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 71; and *Male Medical Register*, vol. iii. (1898), No. 34.

SERIES XXVI.

DISEASES OF THE THYMUS AND THYROID GLANDS.

HÆMORRHAGE INTO THYROID CYST.

2310h. A Section of the Cystic Left Lobe of a Thyroid Gland, showing the results of electrolysis. It consists of a single cyst, the wall of which is thick and fibrous, and which is filled with blood clot. Attached to it is a piece of skin from the front of the neck, showing ulceration; between the skin and the cyst wall is a mass of inflammatory tissue and blood clot, the latter having been effused into the tissues in successive layers. At two points there can be seen the track of the blood as it passed through the cyst wall.

From a gentleman æt. 50 years, who for 8 years had been affected with a unilateral cystic goitre, which caused little or no trouble except from its bulk. He was treated at length for several months by electrolysis, the needles being passed into the interior of the cyst. Hæmorrhage took place, partly into the cyst and partly, through the punctures, into the tissues of the neck. This caused great increase in the size of the tumour, which pressed upon the skin till the latter gave way. The tumour was then removed, as a strong suspicion of malignancy existed. The true nature of the case was then revealed. The patient made a rapid and complete recovery.

Presented by H. T. Butlin, Esq.

SERIES XXVII.

DISEASES OF THE SUPRARENAL BODIES.

HÆMORRHAGIC SUPRARENAL BODY.

2320c. A Kidney and Suprarenal Capsule similar to the preceding specimen, showing an intensely hæmorrhagic condition of the suprarenal.

From a female infant æt. 4 months, who was brought to the Hospital dead after two or three days' illness. A purpuric rash was present over the trunk and

limbs. No other lesions were found at the autopsy. The suprarenals were both similarly affected. Bacteriological examination of the blood and all the viscera was entirely negative. The nature of the disease remained doubtful, but the case is precisely parallel to the preceding one.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 125; and *Transactions of the Pathological Society*, vol. xlix. (1898), p. 256.

TUBERCULOSIS OF SUPRARENAL BODY.

2325a. Section through a Kidney and Suprarenal Body. The suprarenal body is enlarged, and completely transformed into caseous material.

From a boy æt. 15 years. The cause of death was not clear, though at the time he was under treatment for tuberculous disease of the tarsus. At the autopsy the body was emaciated, and showed distinct yellowish-brown pigmentation; there was old and recent tuberculosis of the lungs and tuberculous disease of the right foot. Both suprarenal bodies were similarly affected. The case was apparently one of Addison's disease.

See *Surgical Post-Mortem Register*, (1897), p. 233; and *Male Surgical Register*, vol. iii. (1897), No. 2106.

SERIES XXVIII.

DISEASES AND INJURIES OF THE KIDNEYS, THEIR PELVES, AND THE URETERS.

THROMBOSIS OF RENAL VEIN.

2331i. The Kidneys of a Child and their vessels, together with a portion of the lumbar spinal column, showing the effect of thrombosis of the renal vein. The inferior vena cava is thrombosed down to the level of the bifurcation of the aorta, and the thrombosis has extended into both renal veins; the clot in the right renal vein is smaller and paler than that in the left, and appeared older at the autopsy. The clots are adherent to the vessel wall. The right kidney is pale, and scarcely increased in size. The left is much enlarged and dark red in colour, showing intense engorgement, and probably actual extravasation of blood.

From a child a year and a half old, who died of pyæmia. There were infarcts in the lung, with pleurisy.

See *Surgical Post-Mortem Register*, (1897), p. 270; and *Female Surgical Register*, vol. iv. (1897), p. 2479.

LARGE WHITE KIDNEY.

2332b. Section of the Large White Kidney of chronic parenchymatous nephritis. The organ is enlarged, and the thickened, pallid cortex contrasts well with the congested pyramids. Underneath the capsule (which stripped easily) are seen dilated venæ stellatæ, and distended vessels are visible everywhere throughout the cortex and medulla.

From a boy æt. 19 years, who died of chronic nephritis and double empyema.

A microscopic section is preserved in the *Histological Records*, xviii. 2332b.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 113; *Male Medical Register*, vol. v. (1898), No. 130.

TUBERCULOSIS OF KIDNEY.

2340. Section of a Tubercular Kidney. The kidney tissue has been almost entirely destroyed, and its place is occupied by cheesy deposit filling loculi which correspond roughly to the pyramids and their equivalent cortical areas. These areas are mapped out on the surface of the kidney, giving it a lobulated aspect. The pelvis of the kidney is little affected, and the ureter and bladder were natural. The opposite kidney was unaffected.

From a woman æt. 50 years. The condition of the kidney was unsuspected during life, the urine having shown nothing abnormal.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 266; and *Female Medical Register*, vol. vi. (1897), p. 292.

TUBERCULAR DISEASE OF KIDNEY.

- 2341i. Section through a Right Kidney showing moderately advanced tubercular lesions. Caseous nodules as large as a cherry are present, and are commencing to break down. They appear to have started in the pyramids and extended into the cortex.

From a boy æt. 11 years, who died of general tuberculosis. He had been treated for some years for a variety of tubercular affections, including spinal caries and tubercular arthritis.

The elbow-joint of this case is preserved in Series ii. No. 639b.

See *Surgical Post-Mortem Register*, (1897), p. 271; and *Male Surgical Register*, vol. v. (1897), No. 3178.

HÆMORRHAGES INTO KIDNEY.

- 2389c. A Kidney showing numerous Hæmorrhages into its substance. The majority of the hæmorrhages are in the boundary zone between the pyramids and the cortex, which is mapped out by them. They are also present in the cortex, and many are visible on the surface beneath the capsule. They show a striated arrangement corresponding to the course of the uriniferous tubules.

From a child æt. 1 year and 7 months, who died of streptococcus septicæmia associated with diphtheria. Hæmorrhages were present in various organs. The bladder is preserved in Series xxix. No. 2045d.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 241; and *Female Medical Register*, (1897), Radcliffe, 81.

SERIES XXIX.**DISEASES AND INJURIES OF THE URINARY
BLADDER.****SUBMUCOUS HÆMORRHAGES IN BLADDER.**

- 2405d. A Bladder showing numerous Submucous Hæmorrhages. They vary in size, and are situated chiefly in the lower part of the organ.

From a child æt. 1 year and 7 months, who died of streptococcus septicæmia associated with diphtheria, with hæmorrhages into various organs.

A portion of the kidney is preserved in Series xxviii. No. 2389c.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 241; and *Female Medical Register* (1897), Radcliffe, 81.

SERIES XXX.

DISEASES AND INJURIES OF THE BRAIN AND ITS MEMBRANES.

CYST OF CHOROID PLEXUS.

2511c. A Cyst of the Choroid Plexus. The right lateral ventricle has been laid open so as to display the cyst *in situ*. It is a simple cyst, with thin transparent walls, arising probably from dilatation of a perivascular lymphatic vessel.

From a man æt. 43 years, who died of hæmatemesis due to cirrhosis of the liver. The dilated œsophageal veins of this case are preserved in Series xv. No. 1857b. See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 242.

SERIES XXXI.

DISEASES AND INJURIES OF THE SPINAL CORD AND ITS MEMBRANES.

GLIO-SARCOMA OF SPINAL CORD.

2541b. Lower Portion of a Spinal Cord, showing a malignant growth occupying the lumbar enlargement. A thin piece of the growth has been removed, about its middle part, for microscopic examination, the cut surfaces being afterwards sutured together so that the form and size of the tumour are practically unaltered. The growth is oval and nodulated: it is $1\frac{1}{2}$ inches long, and its upper end is just below the twelfth dorsal nerve roots. The anterior surface of the cord is not involved—the tumour lying chiefly on its posterior and lateral surfaces. Below, the growth extends downwards as a nodular ridge on each side of the posterior aspect of the lumbar enlargement. Transverse sections show that it apparently started in the posterior half of the cord, near the central canal, and has destroyed the posterior cornua, compressing, but not destroying, the anterior cornua and columns. Microscopically it is a glio-sarcoma. Above the growth well-marked ascending degenerations are present.

From a man æt. 55 years, who died sixteen months after the onset of the first symptoms. Pain and weakness in the right knee were the earliest symptoms noted, followed, fourteen months later, by similar symptoms in the left knee, and difficulty in micturition. Both knee-jerks were absent; sensation was im-

paired in both legs, but nowhere completely absent; loss of power was more marked in the left leg than in the right. Pain in the back was absent.

Microscopic specimens of the growth and cord are preserved in the *Histological Records*, xxxi. 2541b.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 13; and *Male Medical Register*, vol. ii. (1898), No. 18.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 6.

HÆMORRHAGE INTO SPINAL CORD.

2547b. A Longitudinal Section of the Upper Part of a Spinal Cord, showing the results of injury. The lesion is sharply localised between the fifth and sixth cervical segments, and is indicated by a patch of hæmorrhage: there is probably also laceration, but this is not very apparent in the specimen. The hæmorrhage has tracked upwards for a short distance between the grey and white matter, and there is a little patchy congestion below.

The patient was a man æt. 64 years, who sustained a complete rupture of the intervertebral disc between the fifth and sixth cervical vertebræ, as the result of a fall downstairs. There was no displacement of the bones after the accident. He lived two days after the injury, and presented the following symptoms:—Complete paralysis and anæsthesia below the level of the arms. Respiration entirely diaphragmatic. All arm muscles paralysed except the deltoids and biceps. Some sensation was retained over the radial side of the wrists and forearms. Face unaffected. No bulbar symptoms. Complete absence of knee-jerks. Persistent vomiting. Temperature slightly raised. The symptoms thus corresponded to a total transverse lesion below the level of the fifth cervical nerves.

The patient was under the care of Mr. H. J. Waring at the Metropolitan Hospital (March 1898). The clinical notes were taken by Mr. R. H. Bremridge, who also prepared the cord, and presented it to the Museum.

SERIES XXXVI.

DISEASES OF THE TESTICLE, ITS COVERINGS, AND OF THE SPERMATIC CORD.

TUBERCULAR DISEASE OF TESTIS.

2774f. A Testis affected by Tubercular Disease. It has been laid open, and shows two caseous nodules, one above and one below, which are just beginning to break down. In the middle of the organ is an area which is studded with large grey semi-translucent tubercles. The epididymis contains numerous tubercles, which are beginning to caseate.

From a man æt. 43 years, who died of general tuberculosis, which was probably secondary to the testicular lesion. The prostate and vesiculæ seminales were extensively affected, as were also both suprarenals.

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 127; and *Male Medical Register*, vol. i. (1898), No. 112.

SERIES XLI.

DISEASES OF THE OVARIES.

OVARIAN CYST FROM AN INFANT.

2904i. An Ovarian Cyst removed from an infant. Although an apparently simple unilocular cyst, it has in reality a few small secondary cysts in its wall, though none are as large as a pea. Microscopically, secondary cysts are numerous in its walls. Probably congenital.

Removed by operation from an infant *æt.* 4 months, whose abdomen had been increasing in size for three weeks. The child made a good recovery. The cyst contained 60 ounces of fluid.

A microscopic section of the cyst wall is preserved in the *Histological Records*, xli. 2904i.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 187.

Presented by D'Arcy Power, Esq., F.R.C.S.

SERIES XLII.

DISEASES OF THE UTERINE APPENDAGES.

CYSTIC HYDATID OF MORGAGNI.

2934c. The Outer End of a Fallopian Tube, showing a dilated hydatid of Morgagni attached to the fimbriated extremity by a slender pedicle some 2 inches in length. A small piece of omentum is adherent to the cyst. Below, the fimbriated end of the tube is seen, but the fimbriæ are less obvious than they were in the fresh condition. There is a small cyst in connection with the parovarium.

From a woman *æt.* 33 years, upon whom an operation was performed for a tubo-ovarian cyst. The condition here shown was found on the opposite side.

For references see No. 2937d in this Series, where the tubo-ovarian cyst is preserved.

HYDROSALPINX AND CYSTIC OVARY.

2936a. Uterine Appendages of the Left Side, showing a coiled and dilated Fallopian tube in a condition of hydrosalpinx. The ovary, seen below, is in a cystic condition. The specimen illustrates a stage in the formation of a tubo-ovarian cyst, but there is as yet no communication between the ovarian cyst and the dilated tube.

From a woman *æt.* 37 years, upon whom abdominal hysterectomy was performed for uterine fibroids.

See *Female Medical Register*, vol. vi. (1897), No. 321.

DOUBLE PYOSALPINX.

2936b. Enormously Distended Fallopian Tubes, removed by operation. The right tube is the larger one; it contained 340 c.c. of pus, and weighed

28 ounces. The left contained 200 c.c. of pus, and weighed $13\frac{1}{2}$ ounces. The pus was sweet, and on bacteriological cultivation yielded no growth: neither gonococci nor tubercle bacilli could be demonstrated in it.

From a woman æt. 33 years, married $12\frac{1}{2}$ years, who had never been pregnant. She had suffered from recurrent pelvic peritonitis, the first attack occurring soon after marriage. The tubes were known to be enlarged four months before operation; ten days before the operation they increased suddenly in size, and formed a tumour reaching nearly to the umbilicus. The patient made a good recovery.

For details of the case, see *Obstetrical Society's Transactions*, 1898.

Presented by C. H. Roberts, Esq., M.D.

TUBO-OVARIAN CYST.

2937d. Uterine Appendages of the Left Side, showing a tubo-ovarian cyst. The Fallopian tube is moderately dilated, and its walls are much thickened. It communicates by an aperture about a quarter of an inch in diameter, through which a coloured glass rod has been passed, with a small ovarian cyst as large as a pear: on the surface of the latter three daughter cysts are visible. The extremity of the tube is adherent to the ovary, but externally the line of junction is not obvious, owing to thickening of the peritoneum.

From a woman æt. 33 years, removed by operation. She had suffered from pain in the left iliac region for five months.

See *Murtha Ward Notes*, (1898), No. 3231 (sub Anne Hazell).

SERIES XLIII.

DISEASES OF THE UTERUS.

CALCIFYING FIBROMATA.

2995a. A Uterus and Appendages. The uterus is small (senile), and shows a small fibroid at the fundus. Attached by a slender peduncle to the anterior surface of the right broad ligament is a large nodulated tumour, almost entirely calcified. Calcareous degeneration is so far advanced that no microscopic determination of its character is possible. It is, however, probably a calcified fibroid which has become detached from the uterus, remaining attached by the peritoneal stalk alone, which has become elongated by dragging. Attached to the upper and anterior portion of the left ovary by a short thick pedicle is a smooth firm tumour. This also contains some calcareous matter, but proves on microscopic examination to be a fibroma.

From a woman æt. 71 years, who died suddenly from spontaneous rupture of the left ventricle.

A section of the ovarian fibroma is preserved in the *Histological Records*, xliii. 2995a.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 190.

Presented by H. B. Maingay, Esq.

CARCINOMA OF UTERUS.

3011a. Cancer of the Body of the Uterus. The uterus has been laid open on the anterior aspect, displaying a fungating growth filling the cavity of the organ. Microscopically the growth is an adenoid carcinoma.

A section is preserved in the *Histological Records*, xliii. 3011a.

Removed by abdominal section from a patient æt. 52 years.

Presented by C. H. Roberts, M.D.

SERIES XLVI.

DISEASES AND INJURIES INCIDENTAL TO GESTATION AND PARTURITION.

FŒTUS PAPYRACEUS.

3073b. A Female Fœtus Papyraceus, of probably five months' development, which was removed by operation from the peritoneal cavity. It was probably derived from an extra-uterine gestation. It is shrivelled and parchment like, and shows several bands and adhesions.

From a woman æt. 35 years, who had not been pregnant before. Pregnancy commenced twelve months before admission to the Hospital. The abdomen increased in size up to the fifth month, when it began to get smaller again. Three months before admission the abdomen increased again in size; menstruation occurred irregularly. Two months before admission she began to suffer from increasing abdominal pain and difficult micturition. On admission a hard irregular abdominal tumour was found, reaching up from the pelvis to $1\frac{1}{2}$ inches above the umbilicus, and extending more on the left than on the right side. On operation this was found to be a cyst, with very friable walls, which contained the fœtus and about two pints of stinking pus. There was no visible placenta. The patient made a good recovery.

See *Female Surgical Register*, vol. ii. (1898), No. 1492.

SERIES XLVIII.

DISEASES OF THE MAMMARY GLAND.

PAGET'S DISEASE OF NIPPLE.

3181h. An Amputated Breast, showing ulceration and destruction of the nipple and areola, in association with carcinoma (Paget's disease). The nipple is completely destroyed, and there is ulceration of a considerable portion of the areola.

From a married woman æt. 64 years. The nipple had been sore for three years. Scirrhus cancer was found in the breast and in the axillary glands.

See *Female Surgical Register*, vol. v. (1897), No. 1274.

COLLOID CARCINOMA OF MALE BREAST.

- 3185f** A Male Breast, showing a tumour of gelatinous appearance, about the size of a cherry. Microscopically it proved to be a colloid carcinoma.

Removed by operation from a man æt. 58 years.

A microscopic specimen is preserved in the *Histological Records*, xlviii. 3185f.

See *Male Surgical Register*, vol. iv. (1898), No. 1259.

SERIES L.**GENERAL PATHOLOGY.****LUPUS OF PERINÆUM.**

- 3233n.** A Patch of Lupus, removed by operation from the perinæum of a woman æt. 40 years, at the margin of the anus. The thickened nodular margin is well seen. The central scarring and depression is the result of old operative interference.

A microscopic specimen is preserved in the *Histological Records*, l. 3233n.

See *Female Surgical Register*, vol. v. (1898), No. 2700.

EPITHELIOMA FOLLOWING TUBERCULAR DISEASE OF CARPUS.

- 3327d.** A Hand with part of the Forearm, showing an extensive fungating growth, originating at the back of the wrist, and spreading around the hand till it has practically encircled it. The hand is claw-like, and the fingers are in an atrophic condition, the index and ring fingers being especially shrunken. Microscopically the growth is a typical epithelioma, with numerous cell nests.

From a man æt. 64 years, who had suffered since childhood from tubercular disease of the carpus. He had noticed the present growth for three months before admission to the Hospital. It commenced at the site of a chronic sinus connected with the wrist-joint.

A microscopic specimen is preserved in the *Histological Records*, l. 3327d.

See *Male Medical Register*, vol. iv. (1898), No. 1211.

COLLOID CANCER OF OMENTUM.

- 3339b.** A Portion of the Great Omentum, thickened by infiltration with colloid cancer. It is suspended by a glass rod passed through the transverse colon, which runs across the upper part of the specimen, and is in one place infiltrated by the growth. The omentum is from 1 to 2 inches thick in parts, and irregularly nodular. It shows well the semi-translucent character of the colloid growth.

From a woman æt. 59 years. The primary growth was probably in the ovary. The duration of symptoms was three months.

A microscopic specimen of the ovarian growth is preserved in the *Histological Records*, l. 3339b.

See *Surgical Post-Mortem Register*, (1897), p. 201; and *Female Surgical Register*, vol. ii. (1897), No. 1736.

COLLOID CARCINOMA: SECONDARY GROWTHS IN BONE.

3340b. Section through part of a Sternum, showing a secondary deposit of colloid carcinoma throughout its whole thickness. There is great local thickening of the bone, with formation of outgrowths on its anterior and posterior surfaces: this appearance is, however, due in large part to subluxation from softening. The semi-translucent character of the growth is well seen.

The patient was a married woman, æt. 39 years, the greater part of whose right breast was removed in June 1890, at University College Hospital, on account of a growth which was regarded as a duct-papilloma, but which re-examination has proved to be carcinomatous. Local recurrence was noted in December 1894, and was surgically dealt with in August 1896, the growths being colloid cancer. General metastasis occurred and she died in January 1898. The sternum was affected two months before death. Some of the metastatic growths had undergone colloid degeneration, others had not.

Part of the skull of this case is preserved in No. 3340c.

A microscopic specimen is preserved in the *Histological Records*, l. 3340b.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 303.

Presented by Dr. W. d'Este Emery.

3340c. Portion of the Skull-Cap of the same patient, showing a large deficiency in the right half of the frontal bone, some 3 inches in length by 2 in breadth, the gap being filled up by a dense membrane. The bone around the edges of the aperture is thickened and irregular. In the small window cut at one place (in order to obtain material for histological examination) the edge of the bone and its passage into membrane is visible in section. The lesion is due to the secondary deposit of carcinoma in the bone, leading to absorption of the bony tissue: the cancerous tissue has then undergone atrophy, leaving only a dense membrane of fibrous tissue. To the naked eye no new growth is visible in the bone: microscopically it is evident enough.

A microscopical section is preserved in the *Histological Records*, l. 3340c.

For references see, in part, under preceding specimen (3340b). The skull was found to be affected three months before death, when, after severe headache of some duration, a depression 2 inches in diameter was found in the right frontal bone. This increased in size, and the right side of the forehead sank in to a depth of about $1\frac{1}{2}$ inches. The skin was unaffected, and there were no cerebral symptoms. The pulsations of the brain could be felt through the membranous gap.

ANGIOMA.

3347c. Section of a Nævoid Growth removed from the subcutaneous tissue of the thigh. It contained no less than 120 c.c. of blood. Microscopically it is an ordinary cavernous angioma, but in one place it contains cartilage.

The patient was a woman æt. 45 years; the duration of the growth was fourteen years.

A microscopic section is preserved in the *Histological Records*, l. 3347c.

See *Female Surgical Register*, vol. i. (1898), No. 1239.

RETROPERITONEAL CYST.

3372a. A Portion of a Cyst removed by operation from behind the peritoneum in the region of the descending mesocolon. The cyst is a simple

one, and has thick walls of dense vascular connective tissue. Its contents are apparently altered blood clot, and were semi-fluid when fresh: a portion of the contents has fallen out. There was no evidence that the cyst arose in connection with either pancreas or kidney; it is surmised that it may have arisen in connection with the remains of the Wolffian body.

The patient was a young woman æt. 20 years, otherwise healthy. The tumour had been noticed for two years, and had increased gradually in size. It was freely movable, painless, and caused no trouble.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 183.

Presented by C. B. Lockwood, Esq., F.R.C.S.

SERIES LIII.

CALCULI AND OTHER CONCRETIONS FORMED IN THE DIGESTIVE ORGANS.

245f. An Enormous Salivary Calculus, weighing 10.2 grammes. It measures 34 mm. in length and 21 mm. in its broadest diameter: its circumference is 60 mm.

It was removed by operation from the parotid duct of a native soldier in the Bengal cavalry.

Presented by Surgeon-Major W. Sykes.

SERIES LVI.

CASTS AND MODELS OF DISEASED AND INJURED PARTS.

FAULTY POSITION OF KNEE-JOINT FOLLOWING EXCISION.

16c. Cast of the Left Knee-Joint of a man æt. 32 years, showing malposition resulting from an excision of the joint for tubercular disease at the age of 4 years. The joint was firmly ankylosed in the position of flexion here shown, and there was much muscular wasting. There was also considerable shortening of the leg.

See *Male Surgical Register*, vol. iv. (1898), No. 74.

OLD TUBERCULAR DISEASE OF ANKLE.

16d. Cast of the Right Foot and Ankle of a boy æt. 12 years, showing the result of old tubercular disease of the ankle-joint. The foot is everted: the movements of the joint were not much limited. The internal malleolus is enlarged and thickened, and above it are the scars left by abscesses in connection with the joint.

See *Male Surgical Register*, vol. iv. (1897), No. 915.

MALPOSITION RESULTING FROM FRACTURE OF TIBIA.

- 30a. Cast of a Left Foot, showing deformity produced by an old fracture at the lower end of the tibia. The foot is everted, with limitation of joint movement. The thickening over the front of the ankle is due to callus.

See *Female Surgical Register*, vol. v. (1898), No. 689.

DEFORMITY OF WRIST FROM INJURY IN CHILDHOOD.

- 45c. Cast of the Left Hand and Lower Part of the Forearm of a man æt. 54 years, showing a deformity resulting from injury at the age of 5 years. There is no sufficient evidence as to the nature of the original injury, but its result has been defective growth at the lower end of the radius. The radius is about $1\frac{1}{2}$ inches shorter than the ulna, and the hand is displaced to the radial side, so that the ulna causes a well-marked prominence. The usefulness of the hand was not impaired: the grasp was good, and the muscles of the forearm well nourished and strong.

See *Male Medical Register*, vol. i. (1898), No. 155.

PARTIAL DISLOCATION OF ASTRAGALUS.

- 58c. Cast of the Left Foot of a man æt. 24 years, showing a deformity resulting from an injury received at the age of 5 years. The astragalus appears to be partially dislocated forwards, causing a marked prominence on the dorsum of the foot. There is a considerable degree of talipes equinus and pes cavus, and there is wasting of the calf muscles.

See *Male Medical Register*, vol. i. (1898), No. 156.

TALIPES VARUS AND PES CAVUS.

- 87i. Cast of the Right Foot of a boy æt. 15 years, showing a condition of inveterate club-foot. The foot is in the position of varus and cavus, with the os calcis drawn up and the cuboid resting on the ground. There is partial dislocation of the astragalus outwards.

Photographs of the case, before and after operation, are preserved in Series lvii. No. 1342n.

See *Male Surgical Register*, vol. v. (1898), No. 819.

SERIES LVII.

DRAWINGS AND PHOTOGRAPHS OF DISEASED OR INJURED PARTS.

ACROMEGALY.

- 3c. Photograph of a man æt. 52 years, showing the characteristic appearances of acromegaly.

The tibia of this case is preserved in Series i. No. 74n.

A microscopic section of the pituitary body is preserved in the *Histological Records*, i. 74n.

For references see under Series i. No. 74n.

CURVATURE OF TIBIÆ DUE TO RICKETS.

- 25a. Photograph of the Legs of a woman æt. 27 years, showing deformity due to former rickets.

See *Female Surgical Register*, vol. ii. (1897), No. 637.

GENU VALGUM.

- 25b. Photograph of a girl æt. 8 years, the subject of great rickety deformity.

See *Female Surgical Register*, vol. ii. (1897), No. 1106.

ANCHYLOSIS OF BOTH HIP-JOINTS.

- 63c. Photograph of a girl æt. 13 years, with ankylosis of both hip-joints, due to bilateral hip-disease. There was some shortening of the left leg (one inch), slight lateral curvature, and well-marked lordosis. The patient could stand and walk fairly well.

See *Female Surgical Register*, vol. ii. (1897), No. 1029.

ANCHYLOSIS OF RIGHT HIP.

- 63d. Photograph showing Ankylosis of the Right Hip-Joint, with faulty position of the right leg.

From a youth æt. 17 years, who had hip-disease two years before, which was treated by extension.

See *Male Surgical Register*, vol. ii. (1897), No. 2931.

RHEUMATOID ARTHRITIS.

- 67b. Photograph of a girl æt. 5 years, the subject of advanced chronic rheumatoid arthritis.

The joints had been swelled for two years before admission.

See *Female Medical Register*, vol. v. (1897), No. 101.

CHARCOT'S DISEASE OF THE KNEE-JOINT.

- 96a. Photograph showing Deformity of the Right Knee produced by Charcot's disease.

From a man æt. 74 years. Enlargement of the knee-joint had existed for two years before the photograph was taken. Both knee-jerks were totally absent, but there were no other signs of tabes. The pupils were equal, and reacted both to light and accommodation.

See *Male Surgical Register*, vol. i. (1897), No. 160.

LATERAL CURVATURE OF SPINE.

132. Photographs of a youth æt. 19 years, suffering from lateral spinal curvature, to illustrate the mode of application of a double Thomas' splint to rectify the deformity.

See *Male Surgical Register*, vol. ii. (1897), No. 664.

133. Photograph of the Back of a boy æt. 14 years, showing marked lateral curvature.

See *Male Surgical Register*, vol. iii. (1898), No. 1285.

ATROPHY OF SPINAL MUSCLES—TREATMENT WITH JACKET.

- 144b. Photographs of a woman æt. 35 years, suffering from atrophy of the spinal muscles. No. 1 shows that the spine is straight when she lies on her back. No. 2 shows inability to stand erect without support. No. 3 shows ability to stand erect with the support afforded by the jacket.

See *Reports of Orthopædic Department*, (1898), No. 160.

UMBILICAL HERNIA.

- 466a. Photograph of a woman æt. 42 years, showing a large, lobular, umbilical hernia.

See *Female Surgical Register*, vol. iv. (1898), No. 57.

INTERSTITIAL HERNIA.

- 468a. Photograph of a man æt. 52 years, showing a large interstitial hernia on the right side.

See *Male Surgical Register*, vol. iii. (1897), No. 3370.

EXOPHTHALMIC GOÎTRE.

- 536b. Photograph of a man æt. 34 years, the subject of well-marked exophthalmic goître.

See *Male Medical Register*, vol. v. (1897), No. 35.

GOÎTRE.

- 582a. Photograph showing a large Goître in a woman æt. 64 years. It was considered to be a goître of long standing, with recent malignant growth.

The patient died two months after the photograph was taken.

See *Female Surgical Register*, vol. i. (1897), No. 154.

TUBERCULAR MENINGITIS.

- 695a. A Drawing of the Left Cerebral Hemisphere of a child who died of tubercular meningitis. The tubercles have a somewhat unusual distribution, being very thickly set over the left Rolandic region. (Leonard Mark, Esq.)

See *Medical Post-Mortem Register*, vol. xxv. (1898), p. 75.

RIGHT FACIAL PALSY.

- 724c. Photograph of a Man suffering from Right Facial Palsy, showing inability to close the eye on the affected side.

ANTERIOR STAPHYLOMA OF SCLEROTIC.

- 736b. A Drawing of the Left Eye of a man æt. 56 years, showing a whitish tumour lying immediately outside the corneal margin. It was incised, and found to be a staphyloma. (Leonard Mark, Esq.)

See *Ophthalmic Ward Book*, (1897), No. 839.

KERATITIS.

- 736c. A Drawing of the Left Eye of a woman æt. 72 years, showing a patch of keratitis of unusual form. (Leonard Mark, Esq.)

See *Ophthalmic Ward Notes*, (1897), No. 128.

KAPOSI'S DISEASE.

- 833b. A Drawing of the Preceding Case taken two years and two months later than 833a. The progress made by the growths is very marked, the nose and nasal septum being extensively involved. (Leonard Mark, Esq.)

The child was 10 years old at the time this second drawing was taken. The growths were subsequently removed as far as possible.

A microscopic specimen of one of the growths is preserved in the *Histological Records*, lvii. 833b, and may be compared with the earlier one, 833a, in the same series. Both are indistinguishable from ordinary epithelioma.

See *Female Medical Register*, vol. ii. (1898), No. 49.

For old references see under 833a in this Series.

ECHTHYMATOUS ERUPTION.

- 897a. Drawing of a Child æt. 1 year, showing on the right shoulder a peculiar eruption of an echthymatous character. The central patches have a black, dry, gangrenous base, and are surrounded by pustules. (Leonard Mark, Esq.)

The eruption was of short duration. Cultures from the pustules yielded only staphylococci. Later the child developed pneumonia and subcutaneous abscesses (which also yielded staphylococci on culture). Good recovery.

See *Female Medical Register*, vol. ii. (1898), No. 48.

IODIDE RASH.

- 921a. Drawing of a Woman æt. 26 years, the subject of syphilis, showing a characteristic and extensive iodide eruption. (Leonard Mark, Esq.)

From the Out-Patient Department for Diseases of the Skin, 1898.

SARCOMA OF MEATUS URINARIUS.

1010. Drawing of the External Organs of Generation of a woman, showing a round mass as large as a walnut growing from the urethral orifice. Microscopically it was found to be a sarcoma. (Leonard Mark, Esq.)

The patient was 68 years of age; the growth had been noticed for three months.

See *Female Medical Register*, vol. vi. (1897), No. 300.

LUPUS OF VAGINA.

1011. A Drawing of the Vagina and External Organs of Generation in a woman æt. 57 years, illustrating the condition known as lupus of the vagina. The smaller drawing shows the appearance of the os uteri as seen through a speculum. Microscopically the condition was shown to be truly tubercular; scrapings from the mucous membrane showed characteristic tubercle, with typical giant-cells. (Leonard Mark, Esq.)

See *Martha Ward Notes*, (1898), No. 3222 (sub J. Revel).

ULCERATION OF VULVA.

- 1011a. Drawing of the External Organs of Generation of a woman æt. 37 years, showing a condition of localised ulceration at various places, including the orifices of Bartholin's glands. The nature of the morbid process was uncertain. (Leonard Mark, Esq.)

See *Female Medical Register*, vol. vi. (1897), No. 352.

RECURRENT SARCOMA OF THE BREAST.

- 1046c. Photograph showing Recurrence of Sarcomatous Growth in the scar, after amputation of the right breast.

From a woman æt. 62 years. Recurrence took place 15 months after partial amputation of the breast for sarcoma. The recurrent growth after removal was found to be a myxo-sarcoma.

See *Female Surgical Register*, vol. i. (1897), No. 471.

TERTIARY SYPHILITIC ULCER.

- 1153a. Drawing of the Face of a Man, showing a tertiary syphilitic ulcer on the lower eyelid. (Leonard Mark, Esq.)

See *Male Surgical Register*, vol. v. (1897), No. 323.

CONGENITAL SYPHILIS.

1156. Drawings of the Lower Part of the Face and of the Anus of a male child æt. 15 months, the subject of congenital syphilis. The face shows an unusual circinate eruption in concentric rings. The anus shows condylomata. (Leonard Mark, Esq.)

From the Out-Patient Department for Diseases of the Skin, 1896.

NÆVOID CONDITION OF LEG, WITH THICKENING OF SOLE OF FOOT.

- 1207a. Drawing of the Right Leg and Foot of a boy æt. 9 years, showing multiple nævoid patches, with great thickening of the skin over the sole of the foot. (Leonard Mark, Esq.)

See *Male Surgical Register*, vol. i. (1898), No. 1440.

RODENT ULCER OF AXILLA.

- 1294a. Drawing of the Chest and Arm of a man æt. 75 years, showing a rodent ulcer of the left axilla of five years' duration. (Leonard Mark, Esq.)

Presented by W. McAdam Eccles, Esq., F.R.C.S.

RODENT ULCER INVOLVING EYEBALL.

- 1296a. Photograph of a very Extensive Rodent Ulcer of the Forehead and Left Cheek, which has invaded the left eyeball.

From a woman æt. 49 years.

Sections of the growth and of the eyeball are preserved in the *Histological Records*, lvii. 1296a (1 and 2).

See *Female Surgical Register*, vol. i. (1898), No. 1298.

TALIPES VARUS AND PES CAVUS.

- 1342n. Two Photographs of the Lower Extremities of a boy æt. 15 years, showing the result of operation for inveterate talipes varus and pes cavus. The upper photograph shows the condition of the right foot before operation, the lower one the result of the operation.

A cast of the right foot before operation is preserved in Series lvi. No. 87i.

See *Male Surgical Register*, vol. i. (1898), No. 819.

CONGENITAL CONSTRICTIONS AND AMPUTATIONS.

- 1359a.** Photograph of a Boy æt. 11 years, showing intrauterine amputation of right hand and constriction of left leg.

A cast of the leg is preserved in Series xxxvii. (*Anatomical and Physiological Catalogue*), No. 90b.

See *Male Surgical Register*, vol. v. (1898), No. 1479. A skiagraph of the forearm is preserved in the *Ward Notes*.

LAMELLAR CATARACT—RIDGED TEETH.

- 1373a.** Photographs of a Man æt. 21 years, who suffered from lamellar cataracts. One shows the facial expression, the other the characteristic ridged form of the teeth.

See *Ophthalmic Ward Notes*, (1898), No. 1546.

TETANUS.

- 1376.** Photograph showing the facial expression in a case of chronic tetanus. The mouth is opened to the full extent.

See *Male Surgical Register*, vol. v. (1897), No. 183.

TERATOLOGICAL CATALOGUE.**SERIES I.—ABNORMAL CONDITIONS OF THE AXIS.****CLASS II.—DUPLICITY.****SUB-CLASS III.—HETEROLOGOUS UNION.****PARASITIC FŒTUS.**

- 3421a.** A New-born Puppy, showing the malformation known as Thoracopagus parasiticus. The parasitic fœtus is attached between the sternum and umbilicus of the autosite. One limb projects from the thorax at the level of the fore-limbs of the autosite.

Presented by Miss Whittingham.

CLASS V.—ARREST OF DEVELOPMENT.**SUB-CLASS II.—IMPERFECT DEVELOPMENT OF THE BRAIN AND ITS MEMBRANES.****DOUBLE CRANIECTOMY PERFORMED FOR MICROCEPHALY.**

- 3441a.** The Brain and Skull of a male microcephalic idiot æt. 13 years, upon whom the operation of craniectomy had been twice performed without any relief to the symptoms. The brain, which has been prepared with formalin and glycerin, weighed 23½ ounces when fresh. It is much atrophied, chiefly in the posterior cerebral lobes, which do not cover the cerebellum. The convolutions in some places are narrowed,

and dense in texture ; in other places they appear almost natural. The skull is small and is narrow transversely, and has a somewhat sloping forehead. It is, however, by no means an extreme example of microcephaly. The fontanelles are closed, and the sutures firmly united, but not actually synostosed. The whole vault of the skull is abnormally thick and dense. The crescentic apertures left by the operations are closed by a dense fibrous membrane, which on the left side (on which the operation was performed three months before death) show indications of commencing ossification, which are barely visible on the right side where the operation had been performed a month later.

The boy had been born at the seventh month, and had never shown any signs of intelligence. There was a history of occasional convulsions, with constant nystagmus and internal squint. The condition was not improved by the operations, and the patient died ultimately with thrombosis of the renal veins and inferior vena cava.

See *Surgical Post-Mortem Register*, (1895), p. 46 ; and *Male Surgical Register*, vol. ii. (1895), No. 3172.

SUB-CLASS V.—DEFECTIVE CLOSURE OF THE AXIAL CANAL OF THE CEREBRO-SPINAL SYSTEM.

MENINGO-MYELOCELE.

3478a. A Median Vertical Section through the Spinal Column of a child, showing a sacral spina bifida. The neural arch of the last lumbar vertebra is complete, but those of the sacral vertebrae are absent. The tumour is a meningo-myelecele, and the filum terminale and one or two spinal nerves are seen crossing the cavity.

From a female child æt. 3 months, who died of hydrocephalus.

See *Surgical Post-Mortem Register*, (1897), p. 99 ; and *Female Surgical Register* vol. iii. (1897), No. 331.

SERIES II.—ABNORMAL CONDITIONS OF THE LIMBS.

CLASS III.—EXCESS OF GROWTH.

MACRODACTYLY.

3501a. The First Two Digits and Metatarsal Bones of the Right Foot, showing the condition known as macrodactyly. The bones appear to share equally with the soft tissues in the overgrowth. The increase in the cutaneous fat is very noticeable.

Removed by operation from a boy æt. 13 years, who was born with enlargement of the first and second toes ; the other digits were normal. There was a little movement in the toes, but some pain on walking. The other foot was normal, and there was no history of similar deformity in the family.

A cast of the foot before operation is preserved in the *Teratological Collection*, Series xxxvii. Class ii. No. 81a.

See *Transactions of the Pathological Society*, vol. xlix. (1898), p. 203.

Presented by Robert Jones, Esq., F.R.C.S.

SERIES VIII.—ABNORMAL CONDITIONS OF THE GENERATIVE ORGANS.

CLASS V.—ARREST OF DEVELOPMENT.

UTERUS UNICORPOREUS ET VAGINA DUPLEX.

3673d. A Uterus with Double Cervix and Vagina. The body of the uterus, which had been severed from the lower portion at the autopsy, has been reunited by sutures. The body is single and normal. There are two complete cervical canals, uniting above at the internal os. There are two complete vaginæ, each with its os externum; the septum separating them is entire, stout, and well developed; the two canals are equal in size, and the rugæ in each are equally well marked. The external organs of generation were normal.

From a woman æt. 22 years, married six months, who died of septicæmia.

See *Surgical Post-Mortem Register*, (1898), p. 20; and *Transactions of the Pathological Society*, vol. xlix. (1898), p. 190.

ANATOMICAL AND PHYSIOLOGICAL CATALOGUE.

SERIES XXXII.

ORGANS OF GENERATION IN THE FEMALE DURING PREGNANCY, WITH SPECIMENS ILLUSTRATING THE DEVELOPMENT OF THE OVUM.

FŒTUS AND MEMBRANES.

1217a. A Fœtus with Placenta and Membranes intact, the result of a miscarriage on the 146th day of pregnancy (the date of impregnation was accurately known).

See *Martha Ward Notes*, (1898), No. 3213 (*sub* C. R. Wood).

FŒTUS.

1248a. A Fœtus of between three and four months.

SERIES XXXVII.

CLASS II.—CASTS OF CONGENITAL MALFORMATIONS.

MACRODACTYLY.

- 81a. Cast of a Foot showing the condition known as macrodactyly, affecting the hallux and second toe.

The patient was a boy *æt.* 13 years. The affected digits were amputated, and are preserved in the *Teratological Collection*, Series ii. No. 3501a, under which heading the case is described.

Presented by Robert Jones, Esq., F.R.C.S.

- 81b. Cast of the Right Hand of a child, showing a condition of macrodactyly affecting the thumb, index finger, and radial side of the hand.

The patient was *æt.* 18 months, and there were no other congenital deformities in the family. The enlargement was noticed when the child was ten days old, and it steadily increased. The thumb and finger were amputated, as the hand was useless. The enlargement was stated to be due to increase in the amount of subcutaneous fat.

See *Transactions of the Pathological Society*, vol. xlvii. (1896), p. 252.

Presented by Robert Jones, Esq., F.R.C.S.

CONGENITAL CONSTRICTIONS.

- 90b. Cast of the Left Leg of a child *æt.* 11 years. It shows two constrictions; the upper and deeper one is about 3 inches below the knee; the lower and slighter one just above the ankle. They had existed from birth, together with other deformities.

The right hand had undergone intrauterine amputation at the radio-carpal articulation; in the left hand, the two distal phalanges of the ring-finger and the last phalanx of the middle finger were absent.

A photograph of the case is preserved in Series lvii. No. 1359a.

See *Male Surgical Register*, vol. v. (1898), No. 1497.

DEFORMITY OF FOREHEAD.

- 108a. Cast of the Forehead of a boy *æt.* 3 years, showing a remarkable median prominence of the forehead.

The prominence was of bony consistency, and the deformity was probably of congenital origin.

See *Male Surgical Register*, vol. v. (1898), No. 586.

III.

HISTOLOGICAL RECORDS OF MUSEUM
SPECIMENS.

- I. **74n.** Section of the Pituitary Body of the case of acromegaly, whose tibia is preserved in Series i. No. 74n, and a photograph of whom will be found in Series lvii. No. 3c. It shows extreme vascularity, hæmorrhages, and thickening of the capsule.

See Series i. No. 74n.

Presented by Dr. William Hunter.

- I. **407.** Section of the Maxillary Growth from an infant preserved in Series i. No. 407. It is a trabecular chondro-sarcoma with some myxomatous change between the trabeculæ.

See Series i. No. 407.

- II. **569e.** Section of the Sarcomatous Growth of the Synovial Membrane of the Knee-Joint preserved in Series ii. No. 569e. It is a pure spindle-celled sarcoma.

See Series ii. No. 569e.

- X. **1656.** Section of the Laryngeal Growth preserved in Series x. No. 1656. It is a squamous-celled carcinoma.

See Series x. No. 1656.

- XI. **1678g.** Section of the Specimen of Carcinomatous Infiltration of the Pleura preserved in Series xi. No. 1678g. It is of columnar-celled type in places; but this was more evident in the primary growth in the breast. (Prepared by J. S. Sandilands, Esq.)

See Series xi. No. 1678g.

- XI. **1702b.** Section of the Lung preserved in Series xi. No. 1702b (septic pneumonia), taken from a part of the lung where consolidation was not far advanced. Scattered foci of purulent inflammation are seen in the neighbourhood of the bronchioles.

See Series xi. No. 1702b.

- XI. **1712a.** Sections of the Glanders Lung preserved in Series xi. No. 1712a. One has been stained in hæmatoxylin and eosin, and shows the histological structure of the glanders nodules. The other has been stained with methylene blue to show the bacilli.

See Series xi. No. 1712a.

xi. 1729c. Section of the Lung preserved in Series xi. No. 1729c. showing the new growth. It is a spheroidal-celled carcinoma.

See Series xi. No. 1729c.

xv. 1842a. Section of the Growth of the Pharynx preserved in Series xv. No. 1842a. It is a sarcoma, containing some fibrous tissue, and in places a large number of blood-vessels.

See Series xv. No. 1842a.

xv. 1843b. Section accompanying Specimen No. 1843b, of Malignant Disease of the Pharynx. It is a squamous-celled carcinoma.

See Series xv. No. 1843b.

xv. 1844c. Section of the Oesophageal Growth preserved in Series xv. No. 1844c. It is a squamous carcinoma in a condition of necrosis.

See Series xv. No. 1844c.

xvii. 1922. Section of the Stomach preserved in Series xvii. No. 1922. It is a colloid carcinoma.

See Series xvii. No. 1922.

xvii. 1923. Microscopic section of Specimen No. 1923 in Series xvii. (Cancer of the Stomach). The coats of the stomach are extensively infiltrated by carcinomatous growth, which is apparently undergoing colloid degeneration.

See Series xvii. No. 1923.

xvii. 1923b. Section through the Malignant Pyloric Growth of the Stomach preserved in Series xvii. No. 1923b. The growth is a spheroidal-celled carcinoma.

See Series xvii. No. 1923b.

xviii. 2027k. Section accompanying the Specimen of Malignant Stricture of the Colon preserved in Series xviii. No. 2027k. It is a typical columnar-celled carcinoma.

See Series xviii. No. 2027k.

xxi. 2198d. Section accompanying the Specimen of Syphilitic Cirrhosis of the Liver, No. 2198d. The cirrhosis is seen to be multilobular and very coarse in character.

See Series xxi. No. 2198d.

xxi. 2202d. Section of the Liver (xxi. 2202d) showing a small gumma. The gumma consists of a mass of caseous material surrounded by dense fibrous tissue. There is a great increase of fibrous tissue in the liver substance, not only in the portal canals, but also between the hepatic cells (inter-cellular cirrhosis).

See Series xxi. No. 2202d.

xxi. 2215d. Section of the Liver preserved in Series xxi. No. 2215d. The section consists almost entirely of sarcoma tissue, small round cells, with an incomplete fibrous stroma.

See Series xxi. No. 2215d.

- xxi. 2215e.** Section of the Liver preserved in Series xxi. No. 2215e. The growth is a mixed-celled sarcoma, composed of large spindle and round cells. Two sections are preserved—one of a solid nodule, the other of the wall of a cavity.

See Series xxi. No. 2215e.

- xxi. 2216g.** Section of the Growth of the Liver preserved in Series xxi. No. 2216g. It appears to be a round-celled sarcoma. The primary growth was in the lung or mediastinum.

See Series xxi. No. 2216g.

- xxi. 2223a.** Section of the Lymphadenomatous Liver preserved in Series xxi. No. 2223a. It shows nodules of typical lymphadenoma. (Prepared by J. H. Churchill, Esq.)

See Series xxi. No. 2223a.

- xxi. 2224b.** Microscopic section of a Nævus of the Liver. (Specimen 2224b in Series xxi.)

See Series xxi. No. 2224b.

- xxiv. 2277a.** Section of Lymphatic Gland from the case of Leukæmia, the mesentery of which is preserved in Series xxiv. No. 2277a.

See Series xxiv. No. 2277a.

- xxv. 2295g.** Section of the Leukæmic Spleen preserved in Series xxv. No. 2295g. The section is taken through the edge of the infarct, and the necrotic character of the latter and the narrow zone of hæmorrhage round it are very obvious.

A Section of the Liver from the same case is also preserved under the same number. It shows well-marked leukæmic infiltration.

See Series xxv. No. 2295g.

- xxv. 2299.** Section accompanying the specimen of Gumma of the Spleen preserved in Series xxv. No. 2299. Tertiary syphilitic changes in the spleen are well seen.

See Series xxv. No. 2299.

- xxv. 2305b.** Section of the Spleen preserved in Series xxv. No. 2305b (Lymphadenoma). The capsule is thickened, and there is great patchy increase of fibrous tissue. The normal structure of the spleen is largely obscured. (Prepared by J. H. Churchill, Esq.)

See Series xxv. No. 2305b.

- xxv. 2305c.** Section of the Spleen preserved in Series xxv. No. 2305c (Lymphadenoma). It shows the changes characteristic of the disease. (Prepared by J. H. Churchill, Esq.)

See Series xxv. No. 2305c.

- xxviii. 2332b.** Section of the Large White Kidney preserved in Series xxviii. No. 2332b. It shows typical chronic parenchymatous change, but hardly any interstitial increase.

See Series xxviii. No. 2332b.

xxxi. 2541b. Section of the Growth of the Spinal Cord preserved in Series xxxi. No. 2541b. The growth is a mixed-celled sarcoma, in places containing numerous branched neuroglia cells and corpora amylacea.

Another section taken from the Cervical Region of the Cord shows well-marked secondary degeneration in the posterior and inner parts of the columns of Goll.

See Series xxxi. No. 2541b.

xli. 2904i. Section accompanying the Ovarian Cyst preserved in Series xli. No. 2904i. It shows a small secondary cyst, which is probably a dilated Graafian follicle.

See Series xli. No. 2904i.

xlili. 2995a. Section of the Pedunculated Tumour connected with the Ovary preserved in Series xliii. No. 2995a. The tumour is a pure fibroma.

See Series xliii. No. 2995a.

xlili. 3011a. Section of the Uterine Cancer preserved in Series xliii. No. 3011a. It is an adenoid carcinoma.

See Series xliii. No. 3011a.

xlvi. 3185f. Section accompanying the Specimen of Colloid Carcinoma of the Male Breast preserved in Series xlvi. No. 3185f. It is a typical colloid carcinoma—the colloid change not being very far advanced.

See Series xlvi. No. 3185f.

l. 3233n. Section of Specimen of Lupus of the Perinæum (Series l. 3233n). The section is taken close to the margin of the anus, and shows both skin and anal mucous membrane. There is very extensive small-celled infiltration of the dermis, and to a far less extent of the epidermis. There are no definite tubercles to be seen, and there are no giant-cells.

See Series l. No. 3233n.

l. 3327d. Section of the Growth preserved in Series l. No. 3327d. It is a typical epithelioma.

See Series l. No. 3327d.

l. 3338. Section of the Tumour of the Second Toe preserved in Series l. No. 3338. It is a mixed-celled sarcoma undergoing myxomatous degeneration.

See Series l. No. 3338.

l. 3339b. Section of the Ovary accompanying Specimen in Series l. No. 3339b, of Colloid Cancer of the Omentum. It is a typical colloid carcinoma.

See Series l. No. 3339b.

l. 3340b. Section of the Colloid Carcinoma of the Sternum preserved in Series l. No. 3340b. The cancellous tissue is rarefied and its spaces are

occupied by carcinomatous tissue, which has in great part undergone colloid transformation. The tissue has been decalcified and the section stained by Van Giesson's method. (Prepared by Dr. W. d'Este Emery.)

See Series I. No. 334ob.

- L. **3340c.** Section accompanying the specimen preserved in Series I. No. 334oc. It has been cut through the line of junction between the bone and the membrane. The spaces in the bone are seen to be filled with carcinoma. Passing towards the membrane, the bony tissue is seen to undergo gradual absorption. Further on the cancerous tissue itself atrophies and disappears, till finally only dense connective tissue remains. (Prepared by Dr. W. d'Este Emery.)

See Series I. No. 334oc.

- L. **3347c.** Section of the Nævoid Growth preserved in Series I. No. 3347c. It is a cavernous angioma.

See Series I. No. 3347c.

- LVII. **833b.** Microscopic section accompanying the drawing of Kaposi's Disease preserved in Series lvii. No. 833b. The section is taken through the nasal septum, and shows the epithelial new growth attacking the mucous membrane. Compare with the earlier section in this Series (833a).

See Series lvii. No. 833b.

- LVII. **1296a** (1 and 2). Sections of the Rodent Ulcer shown in the photograph in Series lvii. No. 1296a. No. 1 is a section of the ulcer itself. No. 2 is a sagittal section through the eyeball. The growth has not penetrated into the interior of the globe, but has attacked the sclerotic and cornea.

See Series lvii. No. 1296a.

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 Juler's Ophthalmic Surgery, 1893
 Waller's Physiology
 Hart and Barbour's Gynecology
 Green's Pathology, 1895
 Quain's Anatomy, Vol. iii., Parts i., ii., and
 iii., 1897
 Jacobson's Operative Surgery, 1897
 Kanthack and Drysdale's Bacteriology
 Calendar of London University, 1898-99
 British Pharmacopœia, 1898
 Schäfer's Essentials of Histology, 1898
 Hale-White's Materia Medica (2 copies),
 1898
 Mitchell Bruce's Materia Medica (2 copies),
 1897
 Cunningham's Practical Anatomy, Vols. i.
 and ii. . . .
 Waring's Manual of Surgery, 1895
 Perkin and Kipping's Organic Chemistry,
 1897
 Luff's Chemistry, 1897
 Wiedersheim's Structure of Man

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The total value of the Scholarships and Prizes awarded annually is £895.

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4. F. GRÖNE.
5. H. H. RAW.
6. H. J. SLADE.
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8. R. T. WORTHINGTON.
9. E. W. J. LADELL.
10. A. E. THOMAS.

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*Foster Prize—*A. T. COMPTON.

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3. A. E. LISTER.
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5. C. A. S. RIDOUT.
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7. A. R. TWEDIE.
8. R. H. R. WHITAKER.
9. J. C. NEWMAN.
10. G. M. SEAGROVE.

Shuter Scholarship—

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EXAMINATIONS, 1897-98.

Lawrence Scholarship and Gold Medal—

T. J. HORDER.

Brackenbury Medical Scholarship—

C. RIVIERE.

Brackenbury Surgical Scholarship—

H. MUNDY.

Matthews Duncan Medal and Prize—

J. L. MAXWELL.

Senior Scholarship in Anatomy, Physiology, and Chemistry—

R. C. ELMSLIE.

Open Scholarships in Science, Chemistry, and Physics—

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Open Scholarship in Biology and Physiology—

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Open Scholarship (Junior) in Biology and Physiology—

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E. C. WILLIAMS	

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Jeaffreson Exhibition—

L. R. TOSSWILL.

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*Lentley Prize (Surgical)—No award.**Hichens Prize—*

F. C. GRÖNE.

Wix Prize—

W. E. L. DAVIES.

Harvey Prize—

1. S. G. MOSTYN.	2. R. C. ELMSLIE.	3. F. C. GRÖNE.	4. E. LADELL.
------------------	-------------------	-----------------	---------------

*Burrows Prize.—No award.**Skynner Prize.—No award.*

PRACTICAL ANATOMY.

JUNIOR.

*Treasurer's Prize—*T. C. NEVILLE.

2. E. B. SMITH.
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4. J. CORBIN.
5. N. E. WATERFIELD.
6. E. C. WILLIAMS.
7. T. R. COULDREY.
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SENIOR.

<i>Foster Prize—</i>	} R. C. ELMSLIE } Æq.

3. F. N. WHITE.
4. R. T. WORTHINGTON.
5. A. E. THOMAS.
6. W. R. READ.
7. E. W. J. LADELL.
8. E. L. MARTIN.
9. H. J. SLADE.

Shuter Scholarship—

F. C. SHRUBSALL.

Junior Scholarships—

- | | |
|--------------------|-----------------|
| 1. E. C. WILLIAMS. | 2. E. B. SMITH. |
|--------------------|-----------------|

Junior Scholarship in Chemistry (1897)—

- | | |
|-------------------|-----------------|
| 1. R. C. ELMSLIE. | 2. F. N. WHITE. |
|-------------------|-----------------|

ENTRANCE SCHOLARSHIPS,

OCTOBER

1898.

*Open Scholarships in Science.**Biology and Physiology—*

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Chemistry and Physics—

(Not awarded.)

Preliminary Scientific Exhibition—

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Junior Open Scholarship in Science.

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J. BURFIELD	

ST. BARTHOLOMEW'S HOSPITAL & COLLEGE.

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Dr. Hensley, Dr. Brunton, F.R.S.

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Mr. Walsham.

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Ormerod, Dr. Herringham, Dr. Tooth.

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Bowlby, Mr. Lockwood, Mr. D'Arcy Power.

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Dr. Hensley, Dr. T. Lauder Brunton, F.R.S.
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Clinical Surgery—Mr. Willett, Mr. Langton, Mr. Marsh, Mr.
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topherson.

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Assistant-Demonstrator—Dr. Morley Fletcher.

Practical Chemistry—Mr. K. J. P. Orton.

Assistant-Demonstrator—Mr. W. C. Reynolds.

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Practical Biology—Dr. Shore.

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Assistant-Curator—Dr. Morley Fletcher.

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Warden—Dr. CALVERT.

Students can reside within the Hospital walls, subject to the College regulations.

Fifteen Scholarships, varying in value from £10 to £150, are awarded annually. See page 383.

Further information respecting Scholarships, Pupils' Appointments, and other details, may be obtained from Dr. CALVERT, and at the Museum and Library.

ST. BARTHOLOMEW'S HOSPITAL REPORTS.

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STATISTICAL TABLES

OF THE

Patients under Treatment

IN THE WARDS OF

ST. BARTHOLOMEW'S HOSPITAL

DURING 1897,

BY

THE MEDICAL REGISTRARS,

JAMES CALVERT, M.D. (LOND.), F.R.C.P.,

AND

ARCHIBALD E. GARROD, M.D. (OXON.), F.R.C.P.,

AND

THE SURGICAL REGISTRAR,

JAMES BERRY, B.S. (LOND.), F.R.C.S.

London:

PRINTED BY CHARLES SKIPPER AND EAST,

49, GREAT TOWER STREET, E.C.

1898

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ST. BARTHOLOMEW'S HOSPITAL.

1897.

Number of Beds in	Medical Wards	241
"	"	"	Wards for Diseases of Women	34
"	"	"	Surgical Wards	...	...	...	...	336
"	"	"	Ophthalmic Wards	...	...	...	...	25
"	"	"	Unassigned	...	...	...	...	38
								<u>674</u>

GENERAL STATEMENT OF THE PATIENTS UNDER TREATMENT DURING THE YEAR 1897.

Patients remaining in, January 1st, 1897 :—								
	Medical	...	...	...	...	239	}	525
	Surgical	...	...	...	...	286		
Admitted during the year 1897 :—								
	Medical	...	...	...	...	2,442	}	6,393
	Surgical	...	...	...	...	3,951		
Discharged :—								
	Medical	...	..	...	...	2,135	}	5,881
	Surgical	...	...	...	...	3,746		
Died :—								
	Medical	...	...	...	...	349	}	568
	Surgical	...	...	...	...	219		
Remaining in, January 1st, 1898 :—								
	Medical	...	...	...	...	197	}	469
	Surgical	...	...	...	...	272		
Patients brought in Dead :—								
	Medical	...	...	...	...	23	}	38
	Surgical	...	...	...	...	15		
Dying in the Surgery or Surgery Ward :—								
	Medical	...	...	...	...	26	}	44
	Surgical	...	...	...	...	18		

OCCUPATIONS OF MALE PATIENTS.

Accountants	4	Chaffcutters	3	Farmers	10
Actors	3	Chair makers... .. .	6	Farriers	4
Agents	6	Cheese monger	1	Felt roller	1
Anthraxene worker	1	Chemists	9	Firemen	3
Apprentice	1	Chimney sweeps	5	Fishermen	2
Architect	1	Chorister	1	Fishmongers	7
Artist	1	Cigar makers... .. .	6	Fish porters	2
Asylum attendants	6	Clergymen	2	Fitters... .. .	8
Asphalter	1	Clerks... .. .	74	Florist	1
Bacon dryer	1	Clickers	2	Football maker	1
Bag maker	1	Clock maker	1	Footmen	4
Bailiff	1	Cloth worker	1	Foremen	6
Bakers	13	Coachmen	17	French polishers	9
Bandsman	1	Coach painter	1	Fretwork carvers	2
Barmen	14	Coalheavers	3	Fruiterers	3
Basket makers	2	Coal merchant	1	Furriers	8
Bath chairman	1	Coastguardsman	1	Gamekeeper	1
Beadle... .. .	1	Coffee house keepers... .. .	2	Galvanizer	1
Belt maker	1	Collar maker	1	Gardeners	21
Bicycle maker	1	Colliers	5	Gas fitters	12
Billiard markers	2	Colour mixer... .. .	1	Gas stoker	1
Billposters	2	Commissionaire	1	Gas worker	1
Birdcage maker	1	Compositors	20	Gate keeper	1
Bird stuffer	1	Confectioners	7	Glass beveller	1
Blacksmiths	17	Contractor	1	Glass blowers... .. .	2
Block base maker	1	Cooks	10	Glass packer	1
Boiler cleaner	1	Coopers	7	Gold refiner	2
Boiler makers	6	Coppersmiths... .. .	2	Goods checker	1
Bookbinders	16	Copper wire worker... .. .	1	Greengrocers	13
Bookkeepers	6	Cordite maker	1	Grocers	11
Booksellers	6	Cork cutters	2	Grooms	9
Boot finishers	5	Costermongers	6	Gun maker	1
Boot laster	1	Costumiers	2	Gymnastic instructor	1
Bootmakers	18	Cowmen	3	Hairdressers	6
Bottle carrier	1	Crape dresser	1	Harness maker	1
Bottle maker... .. .	1	Cutler... .. .	1	Hatters	3
Bottler	1	Cycle makers... .. .	2	Hawkers	8
Box makers	5	Dealers	4	Herdsmen	2
Brace makers... .. .	2	Decorators	7	Horse keepers	9
Brass finishers	7	Dentist	1	Hospital servant	1
Brass founder	1	Dep. of Lodging House	1	Hotel porter	1
Brewers	7	Designer	1	House breaker	1
Bricklayers	14	Diamond cutter	1	Housekeeper	1
Brick makers... .. .	7	Diver	1	Indiarubber worker	1
Brush makers	6	Disinfecter	1	Ink maker	1
Builders	12	Drapers	8	Inspectors	2
Butchers	30	Draughtsman	1	Instrument cleaner	1
Butlers	4	Drayman	1	Instrument makers	3
Cabinet makers	23	Drivers	6	Ironmongers	3
Cabmen	15	Drover	1	Iron moulders	3
Cab washers	3	Druggist	1	Iron workers	9
Camera maker	1	Dustmen	2	Ivory worker... .. .	1
Canvasser	1	Dyers	2	Jewellers	2
Capsule maker	1	Electricians	4	Joiners	4
Caretakers	7	Electrotypers... .. .	3	Journalists	2
Carmen	95	Embosser	1	Kitchen boys	2
Carpenters	39	Engine cleaner	1	Knife cleaners	2
Carriage cleaner	1	Engine drivers	7	Knife grinder	1
Carriage trimmer	1	Engineers	25	Label cutter	1
Carriers	4	Engravers	3	Labourers	225
Carts	2	Errand boys	12	Lamp lighters	2
Cashier	1	Excavator	1	Land owner	1
Cavalryman	1	Factory men	3	Laundryman	1
Cellarmen	9	Fancy box maker	1		

OCCUPATIONS OF MALE PATIENTS (*continued*).

Lavatory attendant...	1	Plumbers ...	13	Stenographer...	1
Law writers ...	4	Policemen ...	5	Stereotypers ...	3
Lead workers...	2	Porters ...	82	Stevadores ...	7
Leather cutter ...	1	Portmanteau makers	4	Stewards ...	5
Leather dressers ...	2	Postmen ...	9	Stick makers...	7
Leather porter ...	1	Post-Office servants...	2	Stokers ...	13
Leather seller ...	1	Potmen ...	18	Stonemasons ...	4
Letter sorter ...	1	Poulterers ...	3	Storekeepers ...	4
Librarian ...	1	Pressman ...	1	Storemen ...	2
Liftman ...	1	Print cutter ...	1	Students ...	29
Lightermen ...	5	Printers ...	58	Sugar boiler ...	1
Lithographers ...	2	Provision dealer ...	1	Surgeons ...	4
Locksmith ...	1	Publicans ...	6	Swimmer, professional	1
Lodge keeper...	1	Rag sorter ...	1	Tailors ...	24
Machinists ...	6	Railway servants	21	Teacher ...	1
Managers ...	4	Relieving officer ...	1	Tea dealer ...	1
Mantle makers ...	2	Reporter ...	1	Tea planter ...	1
Masons ...	4	Rigger...	1	Tea taster ...	1
Match makers ...	2	Rivetter ...	1	Telegraphists...	4
Mat makers ...	2	Road sweeper ...	1	Ticket collector ...	1
Meat porters ...	3	Rope maker ...	1	Ticket writers ...	2
Mechanics ...	2	Saddler ...	1	Tie makers ...	2
Medical men ...	2	Sailors...	25	Timekeepers ...	7
Messengers ...	25	Salesmen ...	4	Tin beater ...	1
Metal workers ...	6	Sanitary worker ...	1	Tin foil worker ...	1
Milkmen ...	6	Saw sharpener ...	1	Tin plater ...	1
Miller ...	1	Sawyers ...	16	Tinsmith ...	1
Millwright ...	1	Scaffolders ...	7	Tobacco cutter ...	1
Miners...	2	Scales maker ...	1	Tobacco packer ...	1
Mineral water worker	1	Scavenger ...	1	Tobacco weighers ...	2
Minister ...	1	Schoolboys ...	324	Toilet-frame maker ...	1
Missionaries ...	2	Schoolmasters ...	4	Toothbrush maker ...	1
Mole catcher ...	1	Scullerymen ...	2	Travellers ...	18
Musicians ...	3	Secretary ...	1	Trimmer ...	1
Navy ...	1	Servants ...	4	Turncock ...	1
Newsvendors ...	10	Sewer workers ...	2	Turners ...	3
Office boys ...	3	Shepherds ...	3	Typefounders ...	5
Oilmen ...	3	Shipbroker ...	1	Umbrella makers ...	3
Omnibus conductors...	6	Shipwright ...	4	Undertakers ...	4
Omnibus drivers ...	6	Shoeblocks ...	6	Upholsterers ...	4
Organ builder ...	1	Shoemakers ...	5	Valet ...	1
Organ grinders ...	2	Shop assistants ...	4	Van builder ...	1
Organist ...	1	Shopkeepers ...	5	Van driver ...	1
Ostlers ...	9	Shopmen ...	4	Van guards ...	26
Packers ...	20	Shunters ...	2	Vellum binders ...	2
Packing-case makers	5	Sieve maker ...	1	Verger... ...	1
Page boys ...	2	Sign writer ...	1	Veterinary Surgeons	2
Painters ...	37	Silk cutter ...	1	Waiters ...	18
Paper hangers ...	5	Silk workers ...	2	Waggoner ...	1
Paper makers ...	2	Silversmiths ...	5	Warehousemen ...	26
Paper stainer...	1	Singer...	1	Watchmakers ...	4
Paviors ...	2	Skin dresser ...	1	Watchmen ...	4
Pawnbrokers ...	2	Slaughters ...	3	Watermen ...	9
Pensioners ...	3	Smith ...	1	Wheelwrights ...	3
Perforator ...	1	Soap maker ...	1	White lead manufacturer	1
Pewterers ...	2	Soldiers ...	25	Window cleaners ...	3
Photographer...	3	Solicitor ...	1	Wine merchants ...	3
Piano veneerer ...	1	Sorters ...	2	Wire workers...	2
Picture-frame makers	5	Spectacle maker ...	1	Wood carvers ...	2
Pipe-case maker ...	1	Stablemen ...	3	Wood cutters...	2
Plasterers ...	2	Stage manager ...	1	Wood turners ...	2
Platelayers ...	11	Stationers ...	3	Zinc worker ...	1
		Steam Timber bender	1		

OCCUPATIONS OF FEMALE PATIENTS.

Actresses 2	Factory girls... .. 4	Office cleaners 6
Artificial flower makers 8	Fancy box maker ... 1	Organist 1
Asylum inmate ... 1	Farm worker... .. 1	
Authoress 1	Feather curlers ... 5	Packer 1
	Firewood cutter ... 1	Paper sellers 2
Barmaids 10	Flower sellers ... 7	Parlourmaids... .. 8
Belt maker 1	French polishers ... 2	Pattern-card makers 2
Bonnet maker 1	Furrier 1	Pickle maker... .. 1
Bookbinder 1	Fur workers 4	Plate polisher 1
Bookfolders 13		Printer's assistant ... 1
Bookkeeper 1	Gilder 1	Public-house keeper... 1
Boot fitter 1	Governesses 4	Purse makers... .. 2
Bootmakers 4		
Bottle washers 2		Rag sorter 1
Box makers 23	Harness maker 1	Sail maker 1
Brace maker 1	Hat makers 3	Saleswoman 1
Brush makers 4	Hawkers 6	School girls 194
Burnisher 1	Hop picker 1	School mistresses ... 5
Buttonhole maker ... 1	Housekeepers 10	Sempstresses 2
	Housemaids 26	Servants 132
Caretakers 2	Housewives 783	Shirt makers 2
Carpet sewer... .. 1	Houseworkers 22	Shop assistants 12
Cartridge maker ... 1		Shopkeepers 11
Cashier 1	Ironers 14	Silk skein maker 1
Chambermaid 1	Jam maker 1	Singer... .. 1
Charwomen 18	Jewellers' workers ... 2	Solderer 1
Chocolate cream maker 1		Stewardess 1
Cigar-box paperer ... 1	Kitchenmaid 1	Surgical instrument maker 1
Cigar makers... .. 2		Syringe maker 1
Cigarette makers ... 3		
Clerks 3		Tailoresses 11
Cloth sorter 1		Tarpaulin maker 1
Coffee-stall keeper ... 1	Lady's maids 7	Teachers 17
Collar starcher 1	Lamp shade maker ... 1	Tent maker 1
Collar turner... .. 1	Laundresses 34	Telegraphist 1
Compositor 1	Lead worker 1	Tie makers 3
Confectioners... .. 6	Leather workers ... 2	Tooth brush drawer... 1
Cooks 36	Lodging-house keepers 3	Toy maker 1
Costermongers 3		Tramp... .. 1
Curtain packer 1	Machinists 35	Typewriter 1
Cutter... .. 1	Mantle makers 8	
	Match makers 2	Umbrella maker 1
Dairymaids 4	Matron 1	
Draper 1	Milliners 10	Violinist 1
Dressmakers 27		
	Needlewomen 13	Waistcoat maker 1
Electric wire wrapper 1	Nurses (children's) ... 31	Waitresses 18
Enameller 1	Nurses (hospital) ... 26	Ward maids 11
Envelope makers ... 3	Nurses (monthly) ... 3	Washerwomen 10
Errand girls 2	Nursemaids 3	Weaver 1

MEDICAL REPORT.

PREFACE TO THE MEDICAL TABLES.

Indices of Medical Cases and of the Post-mortem Register for the year are appended to the Statistical Tables.

The system of classification introduced in 1895 has been continued. The Medical cases (with the exception of those in Radcliffe and Isolation Wards, which are bound together under the name of Radcliffe), are bound and indexed according to the Physician under whose care they were.

Thus of Male Patients :—

Those under Dr. Church are bound in Vol. I.

„	„	Dr. Gee	„	„	II.
„	„	Sir Dyce Duckworth	„	„	III.
„	„	Dr. Hensley	„	„	IV.
„	„	Dr. Lauder Brunton	„	„	V.

The Female cases are similarly numbered, and those under Dr. Champneys are bound in Vol. VI.

Also following the plan introduced in 1895, Alphabetical Indices of Patients' names, and of their diseases and chief symptoms, have been embodied in special volumes, one for Male and one for Female cases. These volumes are kept with the notes of the year.

It may be mentioned that the Tables and Indices which follow are not strictly comparable with each other. In Table I. each case only occurs once under the chief disease or symptom, whereas in the Clinical Index prominent secondary symptoms and special methods of treatment are included. Again, the Post-mortem Index includes records of a number of Patients brought in dead or dying in the Surgery Ward, who, not having been admitted to the Hospital, appear neither in Table I. nor in the Clinical Index.

DISEASE.	Total.																							
	Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	M.	F.	M.	F.	Discharged.	Died.	Discharged.	F.	M.	F.	Discharged.	F.	M.	F.	Discharged.	F.	M.	F.	Discharged.	F.	M.	F.		
GENERAL DISEASES.																								
B.																								
Acromegaly ...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Anæmia ...	31	1	30	...	...	...	...	1	...	...	...	10	...	14	...	...	...	...	2	...	...	...
Pernicious ...	6	4	1	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	1	...	...	...
Caisson Disease ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debility ...	9	6	3	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...	...	...	...
Adenitis ...	2	...	2	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...
Gout ...	10	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Graves's Disease ...	15	1	14	...	...	...	...	...	...	...	...	1	...	10	...	1	2	...	7	...	...	...
Leucocythæmia ...	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lymphadenoma ...	7	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Marasmus ...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...
Edema ...	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Osteo-arthritis ...	10	6	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Periostitis ...	3	2	1	...	...	...	...	...	...	...	...	...	...	1	1	...	2	...	1	2	...	...
Otorrhœa ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raynaud's Disease ...	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rickets ...	9	7	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rheumatic Fever ...	120	80	37		
Rheumatism ...	19	11	8		
Gonorrhœal ...	5	4	1		
Sarcoma, Melanotic ...	2		

B.

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DISEASE.	Total.		Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
LOCAL DISEASES.																									
DISEASES OF THE NERVOUS SYSTEM.																									
<i>General.</i>																									
Chorea	51	16	34	1	...	...	2	6	10	13	3	10	1	5	...	...	...	...	...	...	...	...	...	...
Disseminated Sclerosis	5	4	1	...	...	...	1	1	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	11	7	4	...	...	...	1	...	...	...	...	...	2	2	1	2	1	...	...	...	...	...	...	...
General Paralysis	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Hypochondriasis	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hysteria	29	5	24	...	...	...	...	...	1	1	6	...	21	1	4	...	1	...	...	...	...	...	...	...
Insanity	5	3	2	...	...	...	...	...	...	...	1	...	...	1	2	...	...	...	...	...	...	...	...	...
Paralysis Agitans	3	3	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tetany	2	1	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Insomnia	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vertigo	5	3	2	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
<i>Cranial.</i>																									
Meningitis	8	4	2	1	3	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Cerebro-Spinal	2	...	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purulent	2	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercular	24	1	...	11	1	2	?	4	4	1	
Aphasia	1	1	
Bulbar Paralysis	3	1	2	2	1	

TABLE I. (continued).

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TABLE I. (continued).

DISEASE.	Total.		Discharged.		Died.	Under 5.	— 10.	— 15.	— 20.	— 30.	— 40.	— 50.	— 60.	Over 60.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE NERVOUS SYSTEM (continued).														
Spinal Irritation ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Syringo-myelia ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tabes Dorsalis ...	11	7	4	...	...	...	...	...	...	...	...	...	...	...
<i>Peripheral.</i>														
Neuralgia ...	3	2	1	...	...	...	...	...	...	...	...	...	...	...
Diphtheritic Paralysis ...	19	16	3	...	...	...	6	1	...	...	...	...	...	...
Neuritis—														
Local ...	6	5	1	...	...	...	...	...	...	...	...	...	...	...
Multiple... ..	10	3	5	...	...	...	...	...	...	...	...	...	...	...
Sciatica ...	9	7	2	...	...	...	...	...	...	...	...	...	...	...
Muscular Spasm ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Wasting ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Cramps ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Spasmodic Torticollis ...	3	...	3	...	...	...	...	...	...	...	...	...	...	...
Tic Doreux ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Optic Atrophy ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Opisthotonus ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Total ...	312	148	118	22	24	...	...	...	...	...	...	...	...	...

TABLE I. (continued).

DISEASE.	Total.		Discharged.		Died.	Under 5.	— 10.	— 15.	— 20.	— 30.	— 40.	— 50.	— 60.	Over 60.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE RESPIRATORY SYSTEM.														
Bronchiectasis ² ..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Bronchitis, Acute ..	30	17	12	1	..	..	..	..	..	..	..	..	..	..
Chronic ..	24	13	7	4	..	1	3	..	3	..	2	1	1	..
Fibrinous ..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Empyema ..	23	13	3	5	2	4	2	1	1	1	1	1	..	1
Empysema ..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Hæmoptysis ..	1	9	7	2	..	..	..	..	..	..	..	..	..	..
Laryngeal Obstruction ..	3	1	2	..	..	1	1	..	..	..	..	..	..	..
Laryngismus Stridulus ..	3	2	1	..	..	1	1	..	..	..	..	..	..	..
Laryngitis ..	10	8	2	..	..	6	2	1	..	..	..	..	..	..
Syphilitic ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..
Lung, Fibrosis of ..	4	1	..	2	1	..	..	..	..	1	..	1	1	..
Malignant Growth of ..	8	..	..	4	..	..	..	..	1	2	..	2	1	..
Phthisis ..	76	35	18	17	4	..	2	2	1	1	9	4	6	2
Pleurisy ..	22	17	5	..	..	1	2	..	1	2	2	2	1	3
Pleuritic Effusion ..	66	45	19	1	1	1	4	3	..	6	4	..	1	1
Sequelæ of ..	1	1	..	..	..	1	1	..	..	5	6	..	10	1
Pneurodynia ..	3	..	3	..	..	..	..	..	..	1	..	..	..	..
Pneumonia, Catarrhal ..	36	14	12	5	5	11	6	1	1	2	..	..	..	..
Croupous ..	146	97	31	13	5	11	1	19	4	1	12	5	7	1
Hydro-Pneumothorax ..	1	1	4	1
Pneumothorax ..	1
Mediastinal Tumour ..	4	1	..	3	1	1	1	..	1	..

TABLE I. (continued).

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TABLE I. (continued).

DISEASE.	Total.	Discharged.		Died.	Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
		Discharged.			Died.	Discharged.		Died.	Discharged.		Died.	Discharged.		Died.	Discharged.		Died.	Discharged.		Died.	Discharged.		Died.
		M.	F.			M.	F.		M.	F.		M.	F.		M.	F.		M.	F.		M.	F.	
DISEASES OF THE DIGESTIVE SYSTEM.																							
Herpes of Soft Palate	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Stomatitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tongue, Malignant Growth of	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tonsillitis	21	5	16	...	...	2	...	...	1	...	3	1	...	1	7	...	3	1	2	...	...	...
Pharyngitis	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dysphagia	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Œsophagus—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malignant Growth of	3	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Obstruction of	3	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1
Peri-oesophageal Abscess	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gastrodynia...	6	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dyspepsia	14	2	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gastritis	13	3	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dilated Stomach	7	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Duodenal Ulcer	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmatemesis	9	3	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gastric Ulcer	43	4	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malignant Growth of	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Stomach	15	4	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gastro-enteritis	11	7	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cholera Nostras	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diarrhoea	26	14	10	1	...	5	...	1	1	2	...	4	1	...	2	...	1	1	3	...	...	...

TABLE I. (continued).

DISEASE.	Total.		Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
DISEASES OF THE DIGESTIVE SYSTEM																									
(continued).																									
Enteritis	2	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Dysentery	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Intestinal Obstruction	4	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Constipation	12	4	8	..	..	..	..	..	..	..	1	..	1	1	2	1	1	2	..	3	..	..	..	..
Ulcerative Colitis	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Colitis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Tubercular Disease of Rectum	1	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Stricture of Rectum	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Fistula in Ano	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Perityphlitis	34	25	9	..	1	2	2	3	3	2	12	1	5	3	..	..	5	3	..	..	..	..	..	..
With Abscess	3	..	..	..	..	..	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Colic	3	3	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..
Peritonitis, Acute	7	1	2	..	..	..	1	1	1	1	1	1	1	1	1	1	1	..	..	..	..	..	..	..
Tubercular	8	5	3	..	..	..	..	..	1	2	1	..	..	1	..	..	1	..	..	..	..	..	..	..
Enlarged Liver	5	3	2	..	..	..	..	..	2	1	..	..	..	1	..	..	..	..	2	1	..	1	..	..
Jaundice	5	3	2	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	1	..	..	..
Gall Stones	8	3	5	..	..	..	..	..	..	..	1	..	..	1	..	1	2	1	..	2	..	..	..	..
Abscess of Liver	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cirrhosis of Liver	29	10	12	2	1	1	1	3	3	4	1	3	3	4	4	3	4	1	..	
Hypertrophic	2	1	1	1	
Hydatid of Liver	1	1	1	

TABLE I. (continued).

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TABLE I. (continued).

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TABLE I. (continued).

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ABSTRACT OF TABLE I.

32

DISEASES.	Total Number of Cases completed during the Year 1897.	Number of Cases discharged.		Deaths.	Remaining in the Hospital at the end of the Year 1897.
		M.	F.		
GENERAL DISEASES, A ...	298	142	106	M. 31	F. 19
Do. B ...	308	152	137	12	7
LOCAL DISEASES—					
Diseases of the Nervous System ...	312	148	118	22	24
" " Circulatory System ...	200	84	72	29	15
" " Respiratory System ...	481	275	124	55	27
" " Digestive System ...	359	137	168	30	24
" " Urinary System ...	103	52	23	20	9
" " Female Generative System ...	275	...	265	...	10
" connected with Pregnancy ...	93	...	83	...	10
" of the Cutaneous System ...	27	5	18	3	1
CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES—					
POISONS ...	28	21	5	1	1
	2,484	1,016	1,119	203	146
		2,135		349	
		2,484		197	

I N D E X

OF THE DISEASES AND CHIEF SYMPTOMS OF PATIENTS DISCHARGED
FROM THE MEDICAL WARDS DURING THE YEAR 1897.

N.B.—The mark (†) signifies that a case terminated fatally; a number in brackets, *e.g.* † (205), indicates the page in the Post-mortem Register, Vol. XXIV., on which notes of the autopsy will be found; (s) that a surgical post-mortem was made.

ABDOMINAL—

- Distension—Females, III., 97.
- Malignant Growth—*See* Malignant Growth.
- Neurosis—Females, VI., 312.
- Pain—Males, I., 8, 9, 187; III., 160, 161. Females, I., 16, 22, 24, 105.
- Pulsation—Females, V., 88.
- Tumour—Males, I., 121, 188; II., 46, 137; III., 174; IV., 42, 157, 212.
Females, I., 44; II., 88, 172; IV., 66; V., 142; VI., 45, 375.
- Wall, Abscess in—Males, II., 121; V., 31. Females, *Radcliffe*, 7, 27.

- ABORTION—Females, II., 168, 183; VI., 34, 111, 126, 267, 274, 295, 319, 334, 345.
Incomplete—Females, VI., 16, 65, 140, 149, 214, 233, 254, 258, 265, 299, 307, 341, 361, 365.
Inevitable—Females, VI., 42.
Hæmorrhage after—Females, VI., 36, 39, 176, 197, 198, 212, 223, 349, 357.
Missed—Females, VI., 262.
Procured, in Heart Disease—Females, VI., 95, 366† (s).

ABSCESS—

- Of Abdominal Wall—Males, II., 121; V., 31. Females, *Radcliffe*, 7, 27.
- Around Appendix Vermiformis—Males, I., 53, 183; II., 38† (s), 184; V., 11† (5), 51†. Females, I., 41, 87† (139); III., 99† (202); IV., 90; V., 131.
- Of Broad Ligaments—Females, VI., 215† (153).
- Cerebral—Males, IV., 53† (72).
- Cerebellar—Females, V., 132† (s).
- Of Chest Wall—Females, II., 92, 92A.
- Cutaneous—Males, II., 253† (299).
- Dental—Males, I., 147.
- About Gall Bladder—Females, I., 129† (237).
- Of Glands of Neck—Males, I., 225.
- Intra-cranial—Males, II., 107† (98).
- Of Labium—Females, III., 94; VI., 251.
- Of Liver—Males, I., 146A† (230); II., 37† (s), 242; III., 150, 164† (227); V., 11† (5), 202. Females, IV., 63† (78).
- Of Lung—Males, I., 146A† (230), 164† (180); V., 11† (5). Females, IV., 28† (18).
- Mammary—Females, III., 65.
- Of Mastoid Cells—Males, II., 107† (98); IV., 167† (147).
- Parametric—Females, VI., 134, 145, 199, 277, 310, 339, 360.
- Pelvic—Females, V., 45; VI., 266, 278.
- Peri-cesophageal—Males, I., 140† (155).

ABSCCESS—*continued.*

Pyæmic—Females, VI., 320.

Rectal—Males, II., 60.

Spinal—Females, IV., 49† (s).

Sub-diaphragmatic—Males, IV., 90† (s) ; V., 181† (261).

Vulvo-vaginal—Females, VI., 350.

See also Otitis Media.

ACROMEGALY—Females, II., 146.

ADENITIS—Females, IV., 12, 14.

Acute Tubercular—Males, II., 98† (110).

ADENOID VEGETATIONS—Females, V., 173.

ALBUMINURIA—Males, I., 116, 129 ; III., 142 ; V., 7.

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ALCOHOLISM—Males, I., 181 ; II., 82, 82A, 111, 151, 153, 167† (212), 186, 220 ; III., 131, 135, 144, 157† (129), 175† (143) ; IV., 247 ; V., 16. Females, II., 46, 118 ; III., 31, 34† ; V., 48 ; VI., 61.

AMAUROSIS (Anæmic)—Females, I., 31 ; II., 82.

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AMYLOID DISEASE—*See* Lardaceous.

ANÆMIA—Males, I., 59 ; III., 190. Females, I., 26, 31, 46, 49, 74, 79, 108, 120, 124 ; II., 60, 101, 194 ; III., 16, 57, 87, 88, 91, 91A, 96, 96A, 114, 116 ; IV., 8, 76, 139, 168, 173, 180 ; V., 38, 72, 84, 102, 107 ; VI., 174.

Pernicious—Males, I., 254? ; II., 21, 183† (232) ; IV., 85, 126. Females, III., 108.

ANÆSTHESIA—Males, III., 64.

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Of Innominate Artery—Males, III., 56 ; V., 89?.

ANGINA PECTORIS—Males, I., 208 ; II., 71 ; III., 87 ; V., 146, 162† (248). Females, III., 73.

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ASTHMA—Males, IV., 187. Females, V., 98, 157.

ATAXIA—Males, III., 154. Females, I., 10.

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ATROPHY—Females, III., 62.

BEDSORES—Males, I., 199 ; II., 40† ; III., 24. Females, I., 89.

BILEDUCTS, Stricture of Common—Females, I., 129† (237).

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Distended—Females, VI., 14.

Malignant Growth of—Males, IV., 118† ; V., 34† (66).

Papilloma of—Males, I., 100† (119).

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BREAST—

Abscess of—Females, III., 65.

Malignant Growth of—Females, V., 155† (293).

BROMOFORM, Treatment of Pertussis by—Females, II., 65.

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BRONCHIECTASIS—Males, I., 164† (180) ; III., 40† (43), 78, 84† (103), 213† (261) ; IV., 33† (27), 70† (92), 88† (87), 209† (236), 255† (320). Females, II., 29† (45).

BRONCHITIS—Males, I., 7, 12, 34, 87†, 95, 100† (119), 172†, 174, 220, 226† (321), 229, 252 ; II., 14, 14A, 32, 33, 40†, 56† (42), 74, 81, 95, 158† (192), 181, 194, 202, 203, 225, 228, 246, 253† (299) ; III., 21, 26†, 38, 77, 104†, 112 ; IV., 7, 35† (32), 41, 45, 47, 73, 82, 110† (121), 187, 231, 232 ; V., 46, 48, 59, 73, 74, 79, 83, 97, 184†, 191† (251). Females, I., 38, 45, 51, 57, 118, 133 ; II., 38, 76, 78, 80, 86, 102, 157, 162, 175, 178, 183, 188, 190 ; III., 37, 38, 48, 75, 92 ; IV., 51, 87, 119, 134, 135, 141, 146, 163 ; V., 2, 41, 58, 62, 71, 80, 128, 140, 171 ; VI., 83, 308, 369. *Radcliffe*—22†.

Fibrinous—Females, II., 29† (45).

BRONCHO-PNEUMONIA—*See* Pneumonia, Catarrhal.

BRONCHUS—

Obstruction of—Males, II., 252† (322) ; III., 213† (264) ; IV., 33† (27), 88† (87).

Rupture of Aneurysm into—Males, III., 213† (264).

BULBAR PARALYSIS—Females, III., 20, 20A.

CÆSARIAN SECTION—Females, VI., 200.

Post-mortem—Females, VI., 32† (39).

CAISSON DISEASE—Males, I., 51 ?† (8).

CALCULUS—

Biliary—Males, II., 99, 112, 207 ; V., 149. Females, II., 12, 24, 186 ; IV., 64, 64A ; V., 75 ; VI., 81† (s).

Renal—Males, I., 33?, 164† (180), 185† (158) ; II., 236 ; III., 8, 184†, 212† (297) ; V., 7?, 85, 192† (277). Females, I., 119 ; II., 151 ; V., 16?, 59?.

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CARBUNCLE, Facial—Males, II., 149† (96).

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CARPO-PEDAL CONTRACTIONS—Females, I., 50.

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CATARACT—Females, II., 204 ; IV., 97.

CEREBELLAR—

Abscess—Females, V., 132† (s).

Hæmorrhage—Males, V., 193† (303).

Tumour—Males, IV., 20.

CEREBRAL—

Abscess—Males, IV., 53† (72). Females, IV., 63† (78).

Embolism—Males, III., 171; V., 2. Females, II., 72?, 141; III., 85; V., 118.

Hæmorrhage—Males, II., 41† (67); III., 100, 166; IV., 129†; V., 150† (218). Females, I., 43; II., 218† (308); III., 23†; IV., 40† (59), 165† (300).

See also Hemiplegia.

Irritation—Males, II., 119, 171.

Thrombosis of Sinuses—Males, IV., 87† (85).

Tumour—Males, II., 250; III., 220† (s); IV., 119, 167† (147). Females, I., 78?; II., 204, 210; III., 122† (295); V., 100† (175).

See also Meninges, Meningitis, Intra-cranial and Pons Varolii.

CHOLECYSTECTOMY—Males, V., 149. Females, VI., 235.

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CHOREA—Males, I., 19, 38, 60, 160; II., 16, 20; III., 44, 51, 69, 182, 194; IV., 68, 199; V., 13, 72, 204. Females, I., 5, 7; II., 23, 69, 73, 79, 103, 109, 208, 215; III., 8, 29, 29A, 52, 89, 104; IV., 10, 24, 34, 67, 72, 73, 74, 79, 95, 99† (69), 157, 169, 176; V., 4, 19, 21, 82, 117, 164, 172.

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Of Fingers—Females, I., 36.

Of Arm—Females, V., 118.

Of Legs—Females, II., 119.

CONVULSIONS—Males, I., 219; II., 63† (80); III., 118. Females, I., 47; II., 39† (63); IV., 63† (78). *Radcliffe*—51† (201), 73†.

CORNEA, Ulceration of—Females, II., 81† (108).

CRAMPS—Females, V., 124.

CREASOTE, Intramuscular injection of (in Phthisis)—Females, II., 128.

CRETINISM, Sporadic—Females, II., 203; V., 77.

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DEBILITY—Males, II., 79; IV., 8, 16, 144, 170, 195. Females, I., 131; V., 163; VI., 72, 96, 246, 314, 347.

DELIRIUM TREMENS—Males, I., 172†; II., 36, 206, 243; III., 55, 121, 136, 142 IV., 89.

DELIVERY, Imperfect—Females, VI., 109.

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DERMOID CYST OF OVARY—I., 88† (149) ; VI., 163, 201, 202, 273.

DIABETES MELLITUS—Males, I., 28, 30, 86, 231 ; II., 5† (25), 66† (90), 97† (109), 170, 231 ; III., 101, 167, 209 ; IV., 37, 46† (57), 165†, 178 ; V., 17† (46), 61, 95†, 114, 158. Females, II., 16, 34† (48), 170† (157) ; III., 98† (240) ; IV., 97.

DIABETIC COMA—Males, II., 5† (25) ; IV., 46† (57), 165† ; V., 17† (46), 95†. Females, II., 34† (48), 170† (157) ; III., 98† (240).

DIAPHRAGM, Perforation of—Males, I., 146A† (230) ; II., 37† (s).

Sub-Diaphragmatic Abscess—Males, IV., 90† (s) ; V., 181† (261).

DIARRHŒA—Males, I., 21, 48, 148, 152, 159, 166, 169, 209 ; II., 69, 75 ; III., 124 ; IV., 158† (181), 180, 189 ; V., 15, 67. Females, II., 48, 81† (108), 106, 165 ; III., 33 ; IV., 109, 119†, 137 ; V., 35, 39, 105.

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DUODENUM—

Duodeno-colic Fistula—Males, IV., 72† (s).

Ulcer of—Females, IV., 1?.

Ulceration of—Males, I., 226† (321).

DURA MATER—*See* Meninges.

DYSENTERY, Chronic—Males, IV., 79.

DYSMENORRHŒA—Females, VI., 31, 61, 82, 93, 144, 162, 174, 236, 315, 348.

DYSpareunia—Females, VI., 33, 112.

DYSPEPSIA—Males, II., 122 ; V., 98. Females, I., 46, 102, 112 ; II., 58, 74, 89, 90, 97, 140, 187, 216 ; III., 106 ; IV., 22 ; V., 18.

See also Gastrodynia.

DYSPHAGIA—Males, I., 17 ; Females (fancied), IV., 128.

EARACHE—Females, III., 112.

ECZEMA—Males, II., 35 ; Females, II., 47.

Vulvæ—Females, IV., 97.

EMPHYSEMA—Males, I., 61, 70, 100† (119), 174, 181, 226† (321) ; II., 23† (3), 32, 33, 56† (42), 149† (96), 151, 175† (204), 194 ; III., 104† ; IV., 2† (13), 35† (32), 46† (57), 73, 82, 85, 110† (121) ; V., 5† (11), 74, 97, 184†, 192† (277). *Radcliffe*—75† (225). Females, I., 45 ; II., 29† (45), 175 ; III., 37, 38 ; IV., 89† (s), 136† (243), 141, 163 ; V., 20.

EMPYEMA—Males, I., 132, 146A† (230), 240† (296) ; II., 120† (140), 148, 221, 241† (306), 251, 254† (317) ; III., 11, 84† (103), 155, 208 ; IV., 34, 50† (71), 52, 53† (72), 70† (92), 128†, 131, 209† (236) ; V., 49, 92, 131, 171. Females, IV., 59, 60, 89† (s), 107† (172), 117 ; V., 112 ; VI., 194† (138). Opening into Lung—Males, I., 240† (296) ; III., 84† (103) ; V., 171. With Resection of Rib—Males, I., 146A† (230), 240† (296) ; II., 148, 221 ; III., 155 ; IV., 52, 128†, 209† (236) ; V., 49, 92, 131. Females, IV., 60, 107† (172) ; V., 112.

ENDOCARDITIS, Ulcerative or Infective—Males, II., 127† (142), 168† (210); III., 215† (269); IV., 164†. Females I., 87† (139); II., 167† (152); III., 1† (2); IV., 98† (123); V., 1†, 67† (113).

ENDOMETRITIS—Females, IV., 163; VI., 7, 13, 27, 54, 64, 76, 98, 104, 114, 114A, 130, 141, 308, 328.

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ENTERIC FEVER—*See* Typhoid Fever.

ENTERITIS—Males, IV., 111, 121. Females, II., 87; IV., 149.

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EPIGLOTTIS, Tubercular Ulceration of—Males, II., 6† (28); III., 214† (273).

EPILEPSY—Males, I., 36; II., 25, 179, 243; III., 94; V., 147. Females, I., 9, 58; II., 56, 210; III. 12; V., 165; VI., 103.

Jacksonian—Males, I., 130; II., 53; IV., 119; V., 166† (265).

EPISTAXIS—Males, II., 2† (33), 21. *Radcliffe*—2. Females, II., 48. *Radcliffe*—49†. *See also* Rheumatism and Typhoid Fever.

ERYSIPELAS—Males, II., 82A.

ERYTHEMA—

Multiforme—Females, I., 18; II., 35, 44; III., 66; IV., 30, 46.

Nodosum—Females, II., 202; III., 64; IV., 100; V., 42.

Papulatum—Males, II., 16.

See also Rheumatism and Typhoid Fever.

ERYTHROL TETRANITRATE—Males, II., 105.

EXOPHTHALMIC GOÏTRE—Males, V., 35. Females, I., 20, 27, 52, 69, 89; III., 42, 126; IV., 27, 91, 93, 152, 177; V., 68; VI., 319.

EXOSTOSES, Hereditary multiple—Females, II., 69.

FALLOPIAN TUBES—*See* Uterine Appendages.

FEBRICULA—Females, II., 100, 176, 196. *Radcliffe*—77.

FIBROMATA, Multiple—Females, I., 11.

FISTULA—

Anal—Males, II., 55† (29). Females, II., 149.

Bronchial—Females, IV., 59.

Duodeno-colic.—Males, IV., 72† (s).

Fœcal—Females, I., 87† (139).

Lacrymal—Females, II., 208.

Recto-vaginal—Females, II., 124†; VI., 9, 122.

Vesico-vaginal—Females, VI., 55, 122, 281, 331.

GALL BLADDER—

Abscesses about—Females, I., 129† (237).

Distended—Females, VI., 235, 285.

Malignant Growth of—Males, V., 34† (66). Females, V., 155† (293).

Rupture of—Females, III., 107† (s).

See also Cholecystectomy.

GALL-STONES—*See* Calculus, Biliary, and Colic.

GALVANISM to Spleen in Leucocythæmia—Males, V., 154.

GANGRENE—

Of Feet—Males, IV., 46† (57). Females, II., 91; IV., 49† (s).

Of Lung—Males, IV., 88† (87). Females, II., 156† (222).

Senile—Males, V., 58.

GASTRIC CRISES—Females, III., 36.

- GASTRIC ULCER**—Males, I., 99† (s), 100† (119); II., 58, 174; III., 15, 139† (160), 185† (244); V., 55. Females, I., 1, 6, 15, 68, 90† (224), 107; II., 4† (1), 19, 45† (65), 57, 62, 142, 181, 214, 217† (323); III., 6, 10, 35, 40, 45, 47, 51†, 96, 96A, 121; IV., 20†, 57, 70, 88; V., 25, 28†, 32†, 102, 103, 106, 109†, 119, 126, 143, 147, 149, 157.
- GASTRITIS**—Males, I., 24; IV., 219; V., 170. Females, I., 17, 26, 113, 128; III., 5, 53; IV., 178; V., 32, 33, 47.
- GASTRODYNIA**—Males, I., 67; II., 224. Females, I., 96; III., 57; IV., 101, 172, 173.
- GASTRO-ENTERITIS**—Males, II., 63† (80), 161; III., 1, 13, 96, 203; IV., 148; V., 127, 139†, 151†, 188. Females, III., 63†; IV., 64; V., 94.
- GASTRO-ENTEROSTOMY**—Males, V., 19.
- GENERAL PARALYSIS OF INSANE**—*See* Paralysis.
- GLYCOSURIA**—Males, II., 107† (98), 193; III., 95; V., 103. Females, II., 11.
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- GONORRHOEAL RHEUMATISM**—Males, I., 2, 194; III., 145; IV., 112, 213. Females, II., 192; VI., 272.
- GOUT**—Males, I., 61, 83† (93), 108† (126), 223, 228; II., 33, 41† (67), 43, 73, 227; III., 3, 42, 43, 56, 67, 73, 80, 111† (146), 139† (160), 157† (129), 173, 185† (244); IV., 54, 117† (116), 125, 152† (188), 226† (253), V., 93† (130).
- HÆMATEMESIS**—Males, I., 226† (321), 232† (288), 241† (316); II., 58, 77, 111, 174, 199† (246); III., 97, 139† (160), 190; IV., 13, 117† (116), 192; V., 55, 135† (173), 163† (242), 181† (261). Females, I., 6, 71, 82, 90† (224); II., 4† (1), 19, 45† (65), 116, 134, 189, 217† (323); III., 10, 45, 82, 96, 119† (262), 121; IV., 53, 57, 70, 88, 139; V., 119, 143, 157.
- HÆMATOCELE, Pelvic**—Females, III., 18; VI., 44, 55, 150, 187, 372.
- HÆMATURIA**—Males, I., 33, 34, 102; II., 98† (110), 104, 104A, 136, 205; IV., 81, 84†, 118†, 127, 157, 164†, 182; V., 54, 85. Females, II., 48; IV., 102; V., 16, 59.
- HÆMOPTYSIS**—Males, I., 145† (158); II., 42, 154; III., 14, 53, 70A†, 73, 136, 148† (195), 161, 198, 212† (297), 213† (264), 218; IV., 9, 26, 36, 61, 86† (84), 145, 152† (188), 155, 181†, 209† (236); V., 117, 135† (173), 200† (311); Females, III., 44; IV., 77; V., 85.
- HEADACHE**—Males, II., 119, 172, 185; III., 131; V., 70. Females, II., 60, 121, 152; III., 112; V., 88, 99.
See also Megrin.
- HEART DISEASE**—Males, I., 14; II., 64; IV., 76, 181†. Females, I., 13.
Asthénia—Males, IV., 125, 153; V., 80. Females, II., 40†.
Congenital—Males, I., 142. Females, I., 87† (139); II., 30; III., 22†, 83, 102.
Dilatation—Males, I., 7, 12, 56† (22), 193† (41), 226† (321); II., 56† (42), 194; III., 104†, 120. Females, II., 30, 113† (223), 169, 191; IV., 36, 136† (243); V., 127; VI., 210.
Fatty Degeneration of—Males, I., 56† (22), 180A† (272), 235† (301); II., 98† (110), 183† (232), 199† (246); III., 68A† (292), 185† (244). Females, IV., 25† (31); VI., 322† (315).
Malignant Growth of—Males, V., 34† (66), 120† (177).
Palpitation of—Females, II., 150.
Tachycardia—Males, V., 64.
Paroxysmal—Males, II., 109.

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VALVULAR—

Aortic Obstructive—Males, V., 72. Females, III., 73; V., 39.

Aortic Regurgitant—Males, I., 257; II., 187. Females, I., 122.

Aortic Double—Males, I., 95, 119, 163† (189), 208; II., 33, 61; III., 12, 12A, 17, 26†, 46, 90, 115, 188, 199; V., 41. Females, I., 98; II., 122; III., 90; IV., 151† (238); V., 9.

Mitral Obstructive—Males, I., 214; II., 31; III., 28, 71, 201; IV., 11, 193; V., 59. Females, II., 25† (34), 40†, 169?; III., 28, 30, 46, 74, 85; IV., 37, 98† (123); V., 1, 110, 118, 122.

Mitral Regurgitant—Males, I., 18, 24, 38, 41† (52), 60, 72, 85, 87, 116, 139, 149, 160, 180, 180A† (272), 181, 227, 227A, 239, 245, 250; II., 5† (25), 20, 48, 72, 117, 144, 218; III., 27, 36, 52† (19), 60, 68, 68A† (292), 76, 127, 153, 169, 171, 182, 194, 197, 216† (287); IV., 4, 5, 6, 18, 25, 44, 49, 68, 86† (84), 108, 109, 134, 185, 186, 198, 199, 208; V., 13, 39† (12), 56, 82, 121, 129, 133, 183, 184†, 185, 204. Females, I., 7, 36, 47†, 51, 59† (95), 60, 126; II., 23, 33, 35, 69, 77, 136, 141, 143† (211), 153† (216), 208; III., 17, 29, 29A, 52, 81, 93, 103, 129; IV., 10, 17, 34, 38, 65, 76, 77, 92, 95, 106† (136), 110, 150; V., 4, 20, 21, 29, 31, 31A, 71, 139, 153† (314); VI., 10, 48, 166.

Mitral, Double—Males, I., 103, 110, 118, 179; II., 9, 13, 83, 230† (305); III., 37, 48, 98, 102, 140† (170); IV., 67, 96; V., 10, 30, 75, 117. Females, I., 37, 65, 78, 83, 86, 93, 116; II., 138; III., 41, 71, 105, 110, 130† (318); IV., 5, 6, 43, 118†, 160; V., 55, 80, 81, 90, 111, 157; VI., 3, 3A, 32, 32A† (39), 99.

Mitral and Aortic—Males, I., 22, 58† (74), 68, 74, 87†, 168, 170, 198, 205, 215, 235† (301), 241† (316), 249; II., 16, 71, 105, 199† (246); III., 159, 185† (244), 205, 212† (297); IV., 38, 55, 75, 91, 110† (121), 157, 164†, 237; V., 21, 24, 99, 100, 130, 146, 162† (248), 165. Females, I., 35, 89; III., 65; IV., 52, 68† (77), 104, 131, 141, 148; V., 17, 37, 65, 83, 84, 149, 160; VI., 366†.

Mitral and Tricuspid—Females, II., 6, 6A, 10; III., 4.

Mitral, Tricuspid and Aortic—Females, IV., 25† (31).

HEBERDEN'S NODES—Females, III., 80.

HEMIANÆSTHESIA (Hysterical)—Females, II., 82, 201; III., 13.

HEMIANOPIA—Females, II., 60.

HEMIPLEGIA—Males, I., 3, 130, 245; II., 30, 40†, 53, 223; III., 64, 80, 85, 100, 166, 171, 211; IV., 94, 98, 102, 172, 245; V., 2. Females, I., 43, 55, 78; II., 32, 49, 61, 72, 77, 141, 206, 218† (308); III., 13, 15, 23†, 55, 85; V., 118.

HERNIA—

Ventral—Females, VI., 337.

HERPES—

Labialis—Males, I., 95. Females, II., 54; III., 50; V., 69.

Zoster—Males, I., 10; III., 43. Females, V., 90.

Of Soft Palate—Females, *Radeliffe*, 69.

HIP-JOINT DISEASE—Males, I., 112.

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HYDATID—

Of Liver—Males, I., 234. Females, IV., 121† (179).

Pelvic—Females, VI., 117.

Subdiaphragmatic—Females, IV., 121† (179).

HYDRAMNION—Females, VI., 95.

HYDRO-NEPHROSIS—Males, V., 40. Females, I., 104; II., 11?, 151.

HYDROSALPINX—Females, VI., 358.

HYPERPYREXIA—Males, II., 63† (80); III., 117† (159), 206† (275); IV., 129†. Females, II., 211† (309).

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HYSTERECTOMY—

Abdominal—Females, VI., 17, 35A, 86, 89, 102, 139† (s), 309, 321.

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HYSTERIA—Males, II., 87, 208 ; III., 135 ; IV., 17, 71. Females, I., 22, 36, 42, 108, 121 ; II., 52, 54, 117, 171, 179 ; III., 13, 43, 43A, 84, 127 ; IV., 44, 126, 171 ; V., 28, 79, 137 ; VI., 30, 164.

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INFLUENZA—Males, II., 130, 131, 138, 161, 177 ; III., 66 ; IV., 194, 253 ; V., 3, 6, 57, 112, 152. Females, I., 75, 114, 127 ; II., 99 ? ; IV., 162 ? ; V., 5, 43, 145.

INSANITY—Females, IV., 36.

Dementia—Males, I., 93 ; II., 53, 70, 159, 219 ; V., 165 ; Females, II., 197, 204.

Hypochondriasis—Males, I., 75. Females, II., 177.

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INSOMNIA—Males, I., 79.

INTESTINE—

Hæmorrhage from—Males, I., 15, 34, 243† (278) ; II., 40†, 199† (246), 230† (305) ; III., 24, 41† (40), 97, 139† (160), 149† (191) ; IV., 103, 219, 240† (313), 252† ; V., 38† (24), 79, 99, 116, 181† (261), 186, 190† (284), 206. Females, I., 6 ; IV., 81† (105), 143 ; V., 125.

Intus-susception of—Males, I., 91† (82).

Malignant Growth of—Males, IV., 192 ; V., 34† (66).

Obstruction of—Males, IV., 42, 46, 72† (s), 140 ; V., 180† (257). Females, II., 59† (s) ; V., 151†.

Perforation of, in Intestinal Obstruction—V., 180† (257).

in Typhoid Fever—Males, I., 49 ?† ; II., 230† (305) ; III., 41† (40), 149† (191) ; IV., 240† (313) ; V., 190† (284), 191† (251). Females, I., 117† (279) ; IV., 81† (105), 132† (249).

Ulceration of—Males, II., 49† (49).

See also Typhoid Fever.

See also Rectum.

INTRA-CRANIAL—

Abscess—Males, II., 107† (98).

Syphilis—Males, II., 47.

Tumour—Males, I., 37 ; III., 204 ; V., 166† (265).

See also Cerebral.

JAUNDICE—Males, I., 27† (50), 31, 181, 192† (219), 193† (41), 214 ; II., 4, 168† (210), 207, 214 ; III., 63, 72 ; IV., 177 ; V., 192† (277). Females, I., 48, 129† (237) ; II., 1, 12, 13A, 24, 186 ; IV., 64, 64A ; V., 40, 139, 155† (293) ; VI., 94.

KIDNEY—

Abscess of—Males, I., 195† (s).

Lardaceous—Males, I., 145† (158).

Malignant Growth of—Males, IV., 100† (107), 150† (187); V., 34† (66), 40, 91A† (156), 166† (265), 181† (261). Females, I., 21† (26).

Moveable—Males, V., 132. Females, II., 95, 123, 127; IV., 102.

Treatment by extract of—Males, III., 58† (86).

Tubercular Disease of—Females IV., 159; V., 136; VI., 292† (266).

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KNEE JOINT, Loose Cartilage in—Females, IV., 161.

LABIUM, Abscess of—Females, III., 94; VI., 251.

LABOUR—

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LAPAROTOMY—Males, I., 53, 123, 183, 195† (s), 234; II., 38† (s), 184, 242; III., 50, 184†; IV., 72† (s), 90† (s), 118†; V., 40, 51†, 106, 157, 202. Females, I., 41, 104; III., 107† (s); IV., 90; V., 131; VI., 14† (s), 43B, 45, 131, 235, 266† (s), 271.

Exploratory—I., 99† (s); II., 169; IV., 118†; VI., 14† (s), 43B, 45, 271.

For Extra-uterine Gestation—Females, VI., 15, 90† (s), 183, 326.

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LARDACEOUS DISEASE—Males, I., 145† (158).

LARYNGITIS—Males, I., 87†, 141; III., 38, 50, 50A; IV., 60, 114, 242. *Radcliffe*—20, 31, 33, 84. Females, I., 86; IV., 133; V., 56, 173. *Radcliffe*—5, 68, 86†.

Syphilitic—Females, II., 200.

Tubercular—Males, I., 127; II., 6† (28); III., 180; IV., 151† (178).

LARYNX, Spasm of—Males, II., 204; IV., 93. *Radcliffe*—17. Females, V., 104.

Edema of—Males, I., 226† (321); III., 58† (86).

Papilloma of—*Radcliffe*, 63, 231.

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Paralysis of Vocal Cords—Females, II., 84† (s).

LEAD POISONING—Males, I., 13, 14; III., 42; IV., 3, 179.

Colic—Males, I., 55; II., 45, 113; III., 59; IV., 3. Females, V., 8, 78.

Paralysis—Males, III., 159; IV., 3.

LEUCOCYTHÆMIA—Males, III., 146; V., 154, 154A. Females, III., 70.

LEUCODERMA—Females, II., 114.

LICHEN—Females, VI., 342.

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LIGATURE OF RIGHT CAROTID AND SUBCLAVIAN—Males, V., 89.

LIVER—

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Cirrhosis of—Males, I., 164† (180), 181, 192† (219), 232† (288), 241† (316); II., 86, 97† (109), 141, 151, 167† (212), 175† (204); III., 54, 95, 97, 144, 144A, 190; IV., 13?, 62, 117† (116); V., 157?, 163† (242), 165, 185. Females, I., 48, 71, 90, 119† (302); II., 1, 8, 13?, 13A?, 81† (108), 104?, 134, 137; III., 58, 60, 119† (262); IV., 170† (234); V., 44, 52, 55, 108, 123.

Hypertrophic—Males, I., 31.

Enlargement of—Males, II., 155; III., 63, 72, 86, 202; IV., 238. Females, II., 13, 13A; III., 30.

Hydatid of—Males, I., 234. Females, IV., 121† (179).

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Malignant Growth of—Males, I., 27† (50), 108† (126); II., 4?, 199† (246); IV., 2† (13), 137, 150† (187), 177, 243 (285); V., 5† (11), 34† (66), 92A† (156), 181† (261), 192† (277). Females, I., 21† (26); V., 155† (293).
 Syphilitic Disease of—Males, IV., 255† (320).

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LUMBAGO—Males, I., 42; III., 33; V., 81.

LUNG—

Abscess of—Males, I., 146A† (230), 164† (180); V., 11† (5). Females, I., 129† (237); IV., 28† (18).
 Collapse of—Females, II., 22?, 30; IV., 125, 134. *Radcliffe*—48†.
 Gangrene of—Males, IV., 88† (87). Females, II., 156† (222).
 Infarcts of—Males, I., 193† (41); II., 168† (210); III., 68A† (292), 212† (297), 216† (287); IV., 86† (84). Females, II., 25† (34); IV., 68† (77); V., 153† (314); VI., 366†.
 Malignant Growth of—Males, I., 108† (126), 164† (180); III., 148† (195); IV., 150† (187), 209† (236); V., 34† (66), 92A† (156), 181† (261). Females, II., 132† (165); V., 121?.
 Syphilitic Disease of—Males, IV., 255† (320).
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LYMPHADENOMA—Males, III., 202; IV., 254† (280); V., 20?. Females, I., 92† (197), 63, 63A, 84† (s); V., 7.

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MALARIA—Males, I., 242; III., 93, 119, 207; IV., 65, 200; V., 44, 57, 82, 134. Females, IV., 129.

MALIGNANT GROWTH—

Of Abdomen—Females, II., 172; VI., 45, 120.
 Of Bladder—Males, IV., 118†; V., 34† (66). Females, VI., 242.
 Of Dura Mater—Males, V., 34† (66). Females, V., 155† (293).
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 Of Heart—Males, V., 34† (66), 120† (177).
 Of Intestine—Males, IV., 192; V., 34† (66). Females, I., 21† (26).
 Of Kidney—Males, IV., 100† (107), 150† (187); V., 34† (66), 40, 92A† (156), 166† (265), 181† (261). Females, I., 21† (26).
 Of Liver—Males, I., 27† (50), 108† (126); II., 4?, 199† (246); IV., 2† (13), 137, 150† (187), 177, 243† (285); V., 5† (11), 34† (66), 92A† (156), 181† (261), 192† (277). Females, I., 21† (26); V., 155† (293).
 Of Lung—Males, I., 108† (126), 164† (180); III., 148† (195); IV., 150† (187), 209† (236); V., 34† (66), 92A† (156), 181† (261). Females, II., 132† (165); III., 1† (2), 76† (148); V., 121?.
 Of Mediastinum—Males, III., 148† (195); IV., 88† (87), 100† (107). Females, III., 1† (2).
 Of Mesentery—Females, V., 14?.
 Of Meatus Urinarius—Females, VI., 300.
 Of Muscles—Males, V., 34† (66).
 Of Esophagus—Males, I., 108† (126), 185† (203); II., 50† (64), 252† (322).
 Of Omentum—Males, V., 180† (257). Females, VI., 249?.
 Of Orbit—Males, V., 34† (66). Females, I., 21† (26).
 Of Ovary—Females, II., 132† (165); VI., 123, 230† (s).
 Of Pancreas—Males, IV., 150† (187), 209† (236); V., 34† (66), 92A† (156), 192† (277).
 Of Pelvis—Females, V., 14; VI., 271.
 Of Pericardium—Males, IV., 209† (236). Females, I., 21† (26).
 Of Peritoneum—Males, II., 247† (281), 243† (285); V., 5† (11), 120† (177), 181† (261).
 Of Pleura—Males, IV., 209† (236), 243† (285), 254† (280); V., 34† (66). Females, IV., 127† (183).

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- Of Prostate—Males, I., 27† (50).
- Of Pylorus—Females, IV., 130† (209) ; V., 76† (s).
- Of Rectum—Females, VI., 265.
- Of Skin—Males, V., 34† (66).
- Of Spleen—Males, IV., 254† (280) ; V., 34† (66).
- Of Stomach—Males, I., 39, 46, 222 ; II., 23† (3), 199† (246), 247† (281), III., 111† (146) ; IV., 2† (13), 132† (163), 137, 243† (285) ; V., 5† (11), 19, 34† (66), 180† (257), 181† (261).
- See also* Of Pylorus.
- Of Suprenals—Males, V., 34† (66).
- Of Testicle—Males, V., 34† (66).
- Of Thyroid—Males, V., 34† (66). Females, I., 21† (26).
- Of Tongue—Males, I., 108† (126).
- Of Tonsil—Females, V., 154† (s).
- Of Uterine Cervix—Females, II., 155 ; VI., 5† (6), 41, 92, 110, 148, 151, 154, 177, 185, 205, 229, 243, 243A, 270, 290, 294, 304, 313, 336, 368.
- Of Uterus—Females, VI., 26, 35A, 71.
- Of Vaginal Wall—Females, VI., 362.
- Of Vulva—Females, VI., 209.

MANIA—*See* Insanity.

MARASMUS—Males, II., 201† (220) ; III., 1. Females, II., 27 ; IV., 26.

MARROW OF BONE, Treatment by—Males, II., 21, 98† (110), 183† (232) ; III., 146, 202 ; IV., 85, 126.

MEASLES—Males, I., 128, 141, 244 ; II., 35, 76, 204 ; IV., 224, 249 ; V., 140† (135). *Radcliffe*—31, 72† (260), 87, 89† (254). Females, I., 86 ; III., 7 ; V., 135† (131). *Radcliffe*—5, 44, 79, 82†, 86†.

MEDIASTINUM—

Malignant Growth in—Males, III., 148† (195) ; IV., 88† (87), 100† (107). Females, III., 1† (2).

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MELÆNA—*See* Intestines, Hæmorrhage from.

MELASMA—Males, III., 202.

MELANOTIC SARCOMA—Males, IV., 177 ; V., 34† (66). Females, I., 21† (26).

MELANURIA—Males, IV., 177. Females, I., 21† (26).

MENINGITIS—Males, I., 123 ; IV., 101, 171†. Females, III., 15 ; IV., 78 ? , 111†.

Purulent—Males, II., 165† (161) ; IV., 87† (85). Females, IV., 63† (78) ; V., 132† (s).

Cerebro-Spinal—Males, I., 81† (99) ; IV., 173† (118).

Tubercular—Males, I., 20† (15), 47† (37), 157† (198) ; II., 98† (110), 200† (274), 244† (229), 245† (233) ; IV., 15† (16), 32† (30), 163† (184), 167† (147), 174† (151), 178 ? ; V., 195† (270). Females, I., 19† (4), 97† (208) ; II., 18† (23), 145† (206), 154† (207) ; III., 25† (53), 78† (145), 117† (282) ; IV., 13† (9), 62† (89), 154† (283) ; V., 158† (294). *Radcliffe*—49†.

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MENORRHAGIA—Females, VI., 66, 231, 234, 239, 332, 348.

MENSES, Retention of—Females, VI., 8.

MESENTERY, Malignant Growth in—Females, V., 14 ?.

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MICROCEPHALIC IDIOCY—Females, II., 213† (245).

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MOLE, Hydatidiform—Females VI. 322† (315).

MYELITIS—Males, I., 199, 255. Females, V., 115.

See also Paraplegia and Polio-myelitis.

MYELO-NEURITIS—Males, II., 123.

MYOCARDITIS—Females, IV., 42† (58).

MYXŒDEMA—Females, I., 38.

NEPHRECTOMY—Males, III., 184†.

NEPHRITIS—

Acute—Males, I., 20† (15), 88, 98, 101† (11); II., 126, 186; III., 7, 9, 107, 163† (228), 177, 192; IV., 10†, 23, 82, 228, 230† (268); V., 182, Females, I., 66; II., 5; IV., 92; V., 53, 169.

Chronic—

Parenchymatous—Males, I., 90, 104, 138; II., 39, 212; III., 58† (86); IV., 27; V., 36† (60), 207. Females, I., 54† (75), 90† (224); II., 153† (216); III., 49, 86† (221); IV., 55, 76, 83, 153; V., 12, 49† (88); VI., 32, 32A† (39), 232† (190), 257, 257A, 350, 350A, 372.

Interstitial—Males, I., 57, 83† (93), 100† (119), 139, 163† (189), 185† (203); II., 2† (33), 41† (67), 49† (49), 55† (29), 127† (142), 149† (96), 175† (204), 179, 194; III., 80, 87, 164† (227), 173, 185† (244), 212† (297), 216† (287); IV., 2† (13), 59, 108, 152† (188), 179, 239, 243† (285); V., 5† (11), 66, 84, 93† (130), 180† (257), 193† (303), 198. Females, I., 4; III., 24† (51); IV., 40† (59), 69† (102), 136† (243); VI., 5† (6).

NEPHROTOMY—Males, IV., 216.

NEURALGIA—Males, IV., 65, 159. Females, II., 161; VI., 143.

NEURASTHENIA—Females, IV., 126.

NEURITIS—Males, I., 64.

Local—Males, II., 232. Females, II., 15.

Multiple—Males, II., 210; III., 181; IV., 204† (226); V., 102. Females, I., 54† (75); II., 20†, 46, 81† (108), 118; III., 31; IV., 18; V., 48.

NEUROMIMESIS—*See Hysteria.*

NODULES, Rheumatic—*See Rheumatism.*

Cutaneous—Females, IV., 164.

NYMPHA, Œdema of—Females, VI., 289.

NYSTAGMUS—Males, I., 61; III., 206† (275). Females, II., 183.

OBESITY—Females, IV., 31; VI., 247.

ŒDEMA OF LIMBS (alone)—Males, II., 123. Females, IV., 103.

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ŒSOPHAGUS—

Abscess around—Males, I., 140† (155).

Malignant Growth of—Males, I., 108† (126), 185† (203); II., 50† (64), 252† (322).

Obstruction of—Males, II., 146; IV., 246.

Perforation of—Males, I., 140† (155); II., 252† (322); V., 135† (173).

Spasmodic Stricture of—Males, V., 103.

OMENTUM, Malignant Growth of—Males, V., 180† (257). Females, VI., 249?.

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See also Paralysis of Cranial Nerves.

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- OPTIC ATROPHY—Males, I., 210 ; III., 19. Females, I., 110.
- OPTIC NEURITIS—Males, II., 47, 124, 173, 175† (204) ; III., 80 ; IV., 59, 101, 126 V., 166† (265). Females, II., 121, 141 ; III., 15.
- ORBIT, Melanotic Sarcoma of—Males, V., 34† (66). Females, I., 21† (26).
- OSTEO-ARTHRITIS—Males, I., 106 ; II., 10, 150 ; III., 39 ; V., 110. Females, I., 123 ; II., 46 ; III., 3 ; IV., 11 ; V., 101 ?.
- OTITIS MEDIA—Males, I., 25, 167, 219 ; II., 107† (98), 135 ; III., 76, 215† (269) ; IV., 167† (147) ; V., 14† (20), 190† (284), 191† (251), 198. *Radcliffe*—36. Females, I., 117† (279) ; II., 130, 152, 156† (222).
- OTORRHOEA—Males, II., 13, 40†, 192†. *Radcliffe*—72† (260). Females, II., 42.
- OVARIOTOMY—Females, VI., 11, 21, 59, 74, 81† (s), 117, 123, 125, 132, 137, 163, 168, 170, 173, 201, 202, 204, 228, 230† (s), 261† (s), 263, 275, 284, 324, 364† (s), 369, 370, 371, 373.
- OVARITIS—Females, VI., 167.
- OVARY—
 Cyst of, Dermoid—Females, I., 88† (149) ; VI., 163, 201, 202, 373.
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 Malignant Growth of—Females, II., 132† (165) ; VI., 123, 230† (s).
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- OVERWORK—Females, VI., 75.
- OZÆNA—Females, III., 54† (91).
- PACHYMEINGITIS—Males, II., 11.
- PANCREAS, Malignant Growth of—Males, IV., 150† (187), 209† (236) ; V., 34† (66), 92A† (156), 192† (277).
- PARÆSTHESIA, Paroxysmal—Males, III., 131.
- PARALYSIS—
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 Agitans—Males, II., 62, 140 ; V., 28.
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 Of Cranial Nerves—Males, II., 28. Females, III., 122† (295) ; V., 155† (293).
 Of Diaphragm—Females, II., 102† (137).
 Diphtheritic—Males, I., 40, 178, 202 ; II., 133, 166, 196, 198 ; III., 110, 116 ; IV., 138, 223 ; V., 18, 94. *Radcliffe*—2. Females, I., 67 ; II., 64, 173. *Radcliffe*—9.
 General, of Insane—Males, II., 52, 82, 82A.
 Infantile, Spinal—*See* Polio-myelitis.
 Facial—Females, II., 91 ; V., 3.
 Of Recurrent Laryngeal—Males, III., 6 ; V., 35. Females, II., 84† (s) ; V., 155† (293).
See also Hemiplegia, Paraplegia, Polio-myelitis.
- PARAMETRITIS—Females, I., 81 ; II., 71 ; VI., 54, 87, 141, 199, 255, 268, 277, 298.
 Sequelæ of—Females, VI., 318, 338 ? , 344.
- PARAPLEGIA—Males, I., 109, 143, 199, 253 ; II., 88, 123.
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 Hysterical—Males, I., 84. Females, I., 70 ; II., 117 ; V., 79.
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 Spastic, Congenital—Males, II., 29 ; III., 191. Females, II., 213† (245).
- PARESIS OF LIMBS—Males, I., 182 ; III., 98. Females, II., 110.
- PAROTITIS—Males, II., 49† (49).
 Gouty—Males, III., 43.

PELIOSIS RHEUMATICA—Males, II., 13. Females, I., 72.

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Abscess—*See* Abscess.

Hæmatocele—*See* Hæmatocele.

Hydatid—Females, VI., 117.

Inflammation—Females, I., 23 ; V., 73 ; VI., 38, 51.

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Neonatorum—Males, V., 137† (141).

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PERFORATING ULCER OF FOOT—Males, I., 201 ; II., 65.

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PERICARDIUM, Adherent—Males, I., 41† (52), 56† (22), 100† (119) ; II., 5† (25), 175† (204) ; III., 111† (146) ; IV., 44 ; V., 100. Females, II., 138 ?.

PERIHEPATITIS—Males, I., 193† (41) ; II., 175† (204) ; IV., 248. Females, I., 119† (302) ; III., 24† (51) ; IV., 69† (102).

PERIMETRITIS—Females, II., 71, 193 ; IV., 33, 149, 174 ; VI., 3, 7, 18, 22, 31, 40, 54, 73, 87, 141, 161, 192, 195, 226, 256, 272, 291, 296, 315, 330.
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Ulcer on—Females, VI., 355.

PERIOSTITIS—Males, III., 24, 47 ; V., 168. Females, II., 160.

PERITONEUM, Malignant Growth of—Males, II., 247† (281) ; IV., 243† (285) ; V., 5† (11), 120† (177), 181† (261).

PERITONITIS—

Acute—Males, I., 49†, 122, 195† (s) ; II., 230† (305) ; III., 41† (40), 149† (191), 164† (227) ; IV., 240† (313) ; V., 180† (257), 190† (284), 191† (251). Females, I., 39† (56), 117† (279) ; III., 68†, 107† (s), 109 ; IV., 80†, 132† (249) ; V., 73, 89† (166) ; VI., 77† (44), 139† (s), 184, 215† (153).

Chronic—Males, I., 99† (s) ; IV., 255† (320).

Tubercular—Males, I., 52† (47) ; II., 15† (10), 54, 189 ; III., 32† (35) ; IV., 106† (114), 142 ; V., 106, 142, 157 ? , 196. Females, I., 33 ; VI., 128, 146, 250†.

PERITYPHLITIS—Males, I., 54, 78, 115 ; II., 3, 69, 164, 182, 188 ; III., 168 ; IV., 48, 58, 123, 133, 149, 184, 222, 227 ; V., 1, 8, 23, 24†, 47, 62, 108, 122. Females, I., 77 ; II., 85 ? , 109, 125 ; IV., 48, 56, 115 ; V., 54, 87, 138.

With Abscess—Males, I., 53, 183 ; II., 38† (s), 184 ; V., 11† (5), 51†. Females, I., 41, 87† (139) ; III., 99† (202) ; IV., 90 ; V., 131.

PERTUSSIS—Males, II., 14, 192†, 202, 209 ; III., 92 ; IV., 24, 35† (32), 45 ; V., 12, 43, 140† (135). *Radcliffe*—51† (201). Females, I., 73, 101 ; II., 27, 39, 65, 111, 112, 120, 163† ; III., 27, 56 ; IV., 9† (7), 59, 94, 155.

PES CAVUS—Females, III., 102.

PHARYNGITIS—Males, IV., 169† (144). *Radcliffe*—92† (289).

PHLEBITIS—Females, II., 28, 41 ; V., 107.

PHLEGMASIA, Alba dolens—Females, II., 5 ; VI., 135.

PHTHISIS PULMONALIS—Males, I., 66, 105, 113, 127, 132?, 145† (158), 150, 155, 163† (189), 213, 246† ; II., 1, 6† (28), 42, 55† (29), 66† (90), 128, 139† (168), 142, 143, 154, 233, 235 ; III., 11, 14, 18, 32† (35), 82, 99, 109, 112, 123, 136, 139† (160), 151, 180, 198?, 214† (273), 219 ; IV., 9?, 36, 40, 46† (57), 50† (71), 61?, 106† (114), 141, 145, 151† (178), 152† (188), 155, 156, 163† (184), 196, 203† (239), 204† (256), 206, 225 ; V., 22, 50, 109, 140† (135), 148† (226), 163† (242), 200† (311). Females, I., 32, 94 ; II., 22?, 67, 67A, 113† (223), 119, 128, 129† (185), 139† (124), 144† (196), 158, 174 ; III., 12, 67, 95, 122, 126?, IV., 9† (7), 61, 66 ; V., 24, 26, 29, 96† (167), 114, 134†.

PLACENTA—

Adherent—Females, VI., 19.

Retained (Removal)—Females, VI., 109, 157, 158, 178, 193, 194† (138), 238, 345.

PLEURA—

Hæmorrhage into—Males, V., 92.

Malignant Growth of—Males IV., 209† (236), 243† (285), 254† (280) ; V., 34† (66). Females, IV., 127† (183).

PLEURISY—Males, I., 68, 94, 111, 127, 162, 173, 180A† (272), 252 ; II., 15† (10), 50† (6±), 74, 108, 110, 116, 132, 213 ; III., 2, 90, 109, 178, 186 ; IV., 33† (27), 64, 169† (144), 175, 255† (320) ; V., 9, 56, 66, 68, 189. Females, I., 86 ; II., 126, 205 ; III., 12, 39, 113 ; IV., 124 ; V., 15, 62.

PLEURITIC EFFUSION—Males, I., 11, 13, 29, 35, 71, 82, 100† (119), 105, 175, 186, 191, 203, 216 ; II., 34, 67, 72, 94, 96, 101, 114, 168† (210), 217, 226, 247† (281) ; III., 24, 32† (35), 54, 54A, 62, 65, 70, 70A†, 95, 103, 108, 141, 156, 163† (228), 164† (227), 195, 213† (264) ; IV., 26, 36, 54, 90† (s), 92, 105, 106† (114), 116, 130, 134, 135, 143, 166† (123), 233, 243† (285), 254† (280) ; V., 14† (20), 25, 29, 32, 45, 50, 52, 78, 90, 118, 126, 160, 174, 181† (261). Females, I., 34, 45† (72), 54† (75), 56, 76, 85† (183) ; II., 98, 115, 143† (211), 182 ; IV., 12, 35, 71, 105, 117, 122, 150 ; V., 27, 34, 46, 51, 86, 92, 121, 162. *Radcliffe*—50† (199).

Bile-stained—Males, III., 141.

Chylous—Females, II., 143† (211).

Sequelæ of—Males, IV., 191.

PLEURODYŊIA—Females, III., 54 ; V., 50, 61.

PNEUMONIA—

Catarrhal—Males, I., 20† (15), 26, 101† (111), 140† (155), 237 ; II., 50† (64), 80†, 120† (140), 157, 162, 163, 209 ; III., 57, 83, 92, 114, 213† (264) ; IV., 24, 35† (32), 83, 168† (150), 202 ; V., 12, 27, 63, 68, 91, 125† (127), 138, 191† (251). *Radcliffe*—14† (36), 18† (81), 39, 46† (76), 47†, 63† (231), 72† (260), 89† (254), 92† (289). Females, I., 2†, 73, 101, 106† ; II., 163† ; III., 11, 27, 77, 79†, 124 ; IV., 45, 47, 60, 94, 96, 155 ; V., 22, 23, 113, 141, 153† (314), 156, 168, 170. *Radcliffe*—30, 50† (199), 52, 74† (267), 78† (250), 81† (241), 85†, 86†.

Croupous—Males, I., 32, 44, 62, 65, 68, 83† (93), 92, 97, 104, 107†, 114, 117, 125, 126, 131, 133, 134, 136, 137, 147, 154, 161, 177, 196, 225, 229, 233† (310), 236, 238, 256† (286) ; II., 12, 17, 19, 44, 59, 60, 73, 84, 100, 126, 127† (142), 156, 158† (192), 176† (194), 190, 191, 192†, 229, 235, 239, 248† (255), 254† (317) ; III., 10, 20, 23, 25, 30, 35† (38), 55, 75, 79, 81, 89, 91, 113, 121, 128, 130, 133, 134, 141, 163† (228), 175† (143), 182, 196, 200 ; IV., 14, 21, 56, 57, 74, 80, 82, 84†, 88† (87), 95, 99, 104, 113, 115, 120, 124, 136, 146, 147, 154, 211, 226† (253), 252† ; V., 26, 33, 42, 44, 54, 65, 69, 76, 77, 78A, 87, 93† (130), 96, 105, 115, 153, 156, 167, 172, 176, 177, 184†. Females, I., 4, 29, 53†, 54† (75), 61, 63, 88† (149) ; II., 14, 20†, 31?, 40?, 93, 125?, 130, 133?, 211† (309) ; III., 2, 32, 34†, 61, 89 ; IV., 4, 28† (18), 29, 39, 98† (123), 116, 117, 144, 145, 156 ; V., 15, 24, 56, 68, 70, 91, 93, 95, 135† (131), 144, 152. *Radcliffe*—56.

PNEUMONIA—*continued*.

Chronic Interstitial—Males, I., 189 ; III., 40† (43), 84† (103), 106 ; IV., 70† (91), 255† (320).

Septic—Females, II., 156† (222).

PNEUMOTHORAX—Males, II., 66† (90) ; IV., 50† (71), 151† (178). Females V., 112.

Hydro—Males, II., 27.

Pyo—Males, I., 213 ; II., 142.

POISONING—

By Ammonium Carbonate—Males, V., 53.

By Carbolic Acid—Males, II., 251 ; III., 125, 129, 157† (129). Females, I., 57 ; II., 212.

By Hydrochloric Acid—Females, III., 54† (91).

By Lead—*See* Lead Poisoning.

By Mackerel—Females, V., 35.

By Mercury—Males, I., 184 ; V., 155.

By Opium—Males, IV., 77.

By Oxalic Acid—Females, V., 66.

By Phosphorus—Males, I., 214.

By Sulphuric Acid—Males, II., 85.

POLIO-MYELITIS, Anterior—

Acute, Infantile—Males, I., 160 (old) ; III., 16. Females, V., 10.

Sub-acute—Males, II., 234†.

PONS VAROLII, Hæmorrhage into—Males, III., 206† (276) ; V., 193† (303). Females, II., 218† (308).**PREGNANCY**—Females, II., 66† (94) ; III., 44, 104, 115 ; IV., 177 ; V., 47, 82 ; VI., 10, 32, 32A, 48, 80, 95, 97, 99, 107, 180, 189, 200, 243, 257, 257A, 283, 297, 350, 366†.

Extra-uterine—Females, VI., 187 ?, 302 ?, 326.

— Rupture of—Females, V., 130† (213) ; VI., 15, 90† (s), 183† (s), 219, 219A.

Vomiting of—Females, I., 115 ; II., 66† (94) ; VI., 68.

PROSTATE, Malignant Growth of—Males, I., 27† (50).**PSORIASIS**—Females, I., 4 ; II., 3 ; IV., 52.**PUERPERAL ECLAMPSIA**—Females, VI., 252.**PULMONARY ARTERIES**—

Obstruction of—Males, III., 148† (195).

Thrombosis of—Males, V., 5† (11). Females, IV., 28† (18), 98† (123).

PULMONARY CATARRH—Females, IV., 83† (100), 86, 120.**PURPURA**—Males, I., 170 ; II., 69, 90, 240 ; III., 117† (159), 212† (297) ; IV., 103 ; V., 36† (60). Females, I., 72 ; III., 66 ; IV., 16, 82† (106).

Hæmorrhagica—Males, II., 98† (110) ; IV., 29. Females, I., 100 ; II., 48 ; III., 21.

See also Peliosis Rheumatica.

PYÆMIA—Males, II., 40† ; III., 164† (227) ; IV., 53† (72) ; V., 11† (5). Females, IV., 49† (s) ; VI., 320, 340† (304).

Chronic—Males, II., 253† (299).

See also Endo-carditis (Ulcerative) and Septicæmia.

PYELITIS—Males, I., 102. Females, I., 119† (302).**PYLEPHLEBITIS**—Males, IV., 90† (s). Females, III., 99† (202).**PYLOBIC**—

Malignant Growth—*See* Stomach.

Obstruction—Males, IV., 215 ; V., 199.

PYO-NEPHROSIS—Males, II., 2† (33) ; III., 184† ; IV., 216.**PYREXIA**—Males, I., 77, 156, 218 ; V., 124, 179. Females, I., 30, 53, 93 ; II., 44 ; IV., 123.**PYURIA**—Males, I., 253 ; II., 106, 153, 169 ; IV., 28, 234. Females, II., 37, 46.

RAYNAUD'S DISEASE—Males, V., 203. Females, I., 28 ; V., 10, 129.

RECTUM—

Abscess of—Males, II., 60.

Stricture of—Males, I., 99† (s).

Malignant Disease of—Females, VI., 365.

Tubercular Ulceration of—Males, II., 55† (29). Females, II., 124†.

RESECTION OF RIB—*See* Empyema—Abscess of Liver.

RETINA—

Detachment of—Males, II., 175† (204).

Hæmorrhage into—Males, I., 254 ; II., 2† (33), 47, 175† (204), 183† (232) ; III., 58† (86) ; IV., 46† (57), 85, 126.

RETINITIS—

Albuminuric—Males, II., 175† (204) ; III., 58† (86) ; IV., 59, 108. Females, II., 194 ; IV., 164.

Diabetic—Males, IV., 46† (57).

RHEUMATISM—

Acute and Sub-acute—Males, I., 50, 60, 63, 68, 69, 72, 80, 85, 110, 116, 158, 172†, 190, 200, 205, 207, 211, 217, 239, 249 ; II., 9, 13, 18, 26, 72, 90, 93, 115, 117, 129, 144, 152, 187, 218, 230† (305) ; III., 17, 27, 36, 37, 45, 49, 60, 68, 102, 105, 122, 127, 133, 153, 158, 182, 183, 188, 189, 193, 197, 199, 201, 205 ; IV., 5, 6, 12, 38, 43, 67, 68, 69, 75, 78, 96, 97, 109, 122, 176, 183, 186, 198, 205, 218, 220, 237, 250 ; V., 4, 13, 21, 29, 41, 86, 111, 119, 129, 133, 159, 161. Females, I., 8, 18, 25, 37, 65, 72, 85† (183), 98, 103, 109, 126 ; II., 9, 35, 50, 75, 96, 131, 164, 185, 198, 207 ; III., 17, 50, 64, 71, 81, 89, 93, 105, 110, 129 ; IV., 3, 37, 42† (58), 46, 54, 65, 84, 131, 166 ; V., 9, 11, 17, 30, 111, 148.

With Albuminuria—Females, II., 198.

With Chorea—Males, I., 60 ; III., 182 ; IV., 68 ; V., 13. Females, III., 89.

With Desquamation—Females, II., 9.

With Erythema Multiforme—Males, II., 13, 230† (305) ; V., 86. Females, I., 18 ; II., 35 ; IV., 46.

With Erythema Nodosum—Females, III., 64.

With Herpes—Females, III., 50.

With Myo-carditis—Females, IV., 42† (58).

With Nodules—Males, I., 60. Females, II., 50.

With Ophthalmia—Females, III., 64.

With Pericarditis—Males, I., 68, 110, 172†, 205, 211 ; II., 13, 72 ; III., 17, 182, 197, 199, 205 ; IV., 38, 96, 250. Females, I., 8, 25, 85† (183) ; II., 35 ; III., 89, 105 ; IV., 42† (58) ; V., 9.

With Pleurisy—Males, I., 68. Females, I., 85† (183) ; III., 110.

With Pneumonia—Males, I., 68. Females, III., 89, 105, 110.

With Purpura—Males, I., 90. Females, I., 72 ; IV., 46.

With Teno-synovitis—Females, V., 30.

With Tonsillitis—Males, I., 63 ; III., 17 ; IV., 183.

With Urticaria—Females, IV., 166.

Chronic—Males, II., 48 ; V., 141. Females, II., 136.

See also Gonorrhœal.

RHEUMATOID ARTHRITIS—*See* Osteo-arthritis.

RIBS, Resection of—*See* Empyema.

RICKETS—Males, I., 26, 52† (47), 76, 91† (82) ; II., 63† (80), 75, 88, 202, 203, 225 ; III., 114 ; IV., 101, 167† (147), 168† (150) ; V., 46, 164. *Radcliffe*—18† (81). Females, II., 17, 86, 175 ; V., 6. *Radcliffe*—43.

RUBEOLA—Males, I., 96, 221.

SALPINGITIS—Females, VI., 21, 358.

Suppurative—Females, VI., 182 ?, 220 ?, 266† (s), 261† (s).

See also Uterine Appendages.

SAPRÆMIA—Females, VI., 287.

SARCOMA—*See* Malignant Growth.

SCARLET FEVER—Males, I., 98, 227A, 244 ; IV., 236. Females, I., 99, 132, 133 ; II., 184. *Radcliffe*—70.

Spastic Hemiplegia following—Females, II., 72.

SCIATICA—Males, I., 23, 242 ; II., 102, 103, 118 ; V., 60, 101. Females, IV., 22 ; V., 60.

SCLEROSIS—

Disseminated—Males, III., 31 ; IV., 107 ; V., 128, 132, 143. Females, III., 20A ? ; V., 115 ?

Lateral—Males, I., 109, 143.

Lateral Amyotrophic—Males, II., 249 ; III., 138.

Postero-lateral—Males, V., 104.

See also Tabes Dorsalis.

SCROTUM, Sloughing Ulcer of—Males, IV., 27.

SEBORRHŒA CAPITIS—Females, III., 56.

SEPTICÆMIA—Males, III., 215† (269). Females, III., 26. *Radcliffe*—81† (241).

SERUM, Treatment by—

Anti-Diphtheritic—Males, V., 157. Females, V., 135 ; and all cases of Diphtheria in *Radcliffe* except 58.

Anti-Pneumococcic—Males, V., 171. *Radcliffe*—62† (131).

Anti-Streptococcic—Males, II., 40†, 253† (299) ; IV., 164† ; V., 106. Females, II., 91 ; III., 26. *Radcliffe*—49†.

SKIN, Melanotic Sarcoma of—Males, V., 34† (66).

SMELL, Loss of Sense of—Females, II., 82.

SPEECH, Affections of—

Aphasia—Males, I., 130, 245 ; II., 53, 127† (142) ; III., 100, 171, 211 ; IV., 172, 245 ; V., 136. Females, II., 91.

Aphonia—Females, V., 79.

In Hysteria—Females, II., 52.

SPINAL—

Curvature—Males, I., 73 ; II., 68, 85. Females, III., 48.

Irritation—Males, IV., 201.

SPINAL CORD, Hæmorrhage into—Males, I., 255.

SPLEEN—

Enlargement of—Males, I., 59 ; II., 21 ; III., 86 ; IV., 238. Females, II., 137 ; III., 16, 46 ; IV., 16, 164 ; V., 39, 120.

Infarction of—Males, I., 240† (296) ; II., 168† (210) ; III., 140† (170), 215† (269). Females, IV., 98† (123) ; V., 67† (115).

Lardaceous—Males, I., 145† (158).

Malignant Growth of—Males, IV., 254† (280) ; V., 34† (66).

Syphilis of—Males, IV., 255† (320).

See also Leucocythæmia.

STOMACH—

Dilatation of—Males, I., 222 ; II., 91 ; III., 132 ; IV., 132† (163), 215 ; V., 52, 83, 199. Females, II., 104 ; III., 72, 120 ; IV., 130† (209).

Malignant Growth of—*See* Malignant Growth.

Perforation of—Males, V., 181† (261).

Ulcer of—*See* Gastric Ulcer.

STOMATITIS—Females, I., 62.

STRIDOR, LARYNGEAL (after Tracheotomy)—Females, II., 7 ; III., 59, 59A.

SUB-DIAPHRAGMATIC ABSCESS—*See* Abscess.

SUNSTROKE—Males, I., 171.

SUPRA-RENAL CAPSULES—

Melanotic Sarcoma of—Males, V., 34† (66).

Tabloids, Treatment by—Males, V., 35. Females, V., 68.

SYPHILIS—Males, I., 3, 64, 109, 143 ; II., 47, 53, 82, 82A ; III., 119, 211 ; IV., 255† (320) ; V., 96. Females, III., 54† (91).

Bone Disease—Females, II., 160.

Congenital—Females, III., 119† (262).

Laryngitis—Females, II., 200.

SYRINGO-MYELIA—Males, II., 78.

TABES DORSALIS—Males, I., 120, 201, 212 ; II., 65, 159 ; III., 19 ; V., 132.
Females, I., 64, 80 ; II., 36 ; III., 36.

With perforating Ulcer—Males, I., 201 ; II., 65.

TACHYCARDIA—*See* Heart.

TÆNIA MEDIOCANELLATA—Males, I., 16, 45, 146 ; IV., 164†. Females, V., 167.

TALIPES—Females, II., 15.

TASTE, loss of sense of—Females, II., 82.

TEETHING—Females, IV., 23.

TENOTOMY—Males, II., 29.

TESTIS, Malignant Growth of—Males, V., 34† (66).

TETANY—Males, V., 205. Females I., 50 ; II., 5 ; V., 6.

THROMBOSIS OF—

Arteries of Limbs—Males, II., 124A.

Pulmonary Arteries—Males V., 5† (11). Females, IV., 28† (18), 98† (123).

Lateral Sinus—Males, IV., 87† (85).

Veins of Limbs—Males, I., 58† (74) ; II., 23† (3), 89 ; III., 195 ; IV., 31, 103, 149. Females, III., 116 ; IV., 147.

THYMUS EXTRACT, Treatment by—Females, I., 20, 27, 69, 89 ; IV., 91.

THYROID EXTRACT, Treatment by—Males, V., 203. Females, I., 38 ; II., 203 ; V., 77.

THYROID GLAND—

Cyst of—Females, III., 80.

Malignant Growth of—Males, V., 34† (66). Females, I., 21† (26).

TIC DOLOREUX—Females, II., 26.

TINNITUS—Males, I., 1.

TONGUE, Carcinoma of—Males, I., 108† (126).

TONSIL, Malignant Disease of—Females, V., 154† (s).

TONSILLITIS—Males, I., 63 ; III., 5, 21, 22, 137, 143, 152 ; IV., 198 ; V., 123.
Females, I., 12, 91 ; II., 21, 108 ; III., 91, 118 ; IV., 19, 27, 51, 75, 133 ; V. 32, 57, 64, 146, 161. *Radcliffe*—59, 60, 76, 90.

TORTICOLLIS—Males, I., 176 ; II., 24. Females, II., 83 ; III., 14, 80.

TRACHEA, Perforation of—Males, I., 140† (155).

TRACHEOTOMY—

For Diphtheria—Males—*Radcliffe*—11, 12, 14† (36), 18† (81), 21† (79), 22, 34, 35, 38†, 39, 41, 46† (76), 47†, 61† (182), 72† (260), 83, 87, 88, 89† (254), 94. Females, IV., 179† (259). *Radcliffe*—1†, 3, 7, 9, 16, 19, 23, 26, 48†, 50† (199), 52, 56, 57, 62† (131), 64, 67, 71†, 74† (267), 78† (250), 80, 82†, 85†, 93† (275).

For Laryngitis—*Radcliffe*—20, 33, 51† (201), 86†.

For Lymphadenoma—Females, II., 84† (s).

TRANSFUSION—

Of Blood—Males, II., 183† (232).

Saline—Males, III., 139† (160); V., 17† (46), 38† (24), 95†, 163† (242).

TREMOR OF TONGUE—Females, II., 53.

TREPHINING OF SKULL—Males, III., 220† (s); IV., 119.

TUBERCULIN R. OF KOCH, Treatment by—Males, IV., 141, 196, 206.

TUBERCULOSIS—

Acute Miliary—Males, I., 20† (15), 47† (37), 52† (47), 157† (198); II., 15† (10), 98† (110), 244† (229), 245† (233); III., 117† (159); IV., 106† (114), 167† (147), 174† (151). Females, I., 19† (4), 97† (208); II., 18† (23), 29† (45), 43† (70), 145† (206), 154† (207); III., 25† (53), 78† (145), 117† (282); IV., 9† (7), 13† (9), 62† (89), 154† (283).

See also Adenitis, Epiglottitis, Intestine, Kidney, Laryngitis, Meningitis, Peritonitis and Phthisis.

TYPHLITIS—See Perityphlitis.

TYPHOID FEVER—

FATAL CASES—Males, I., 49†, 243† (278); II., 40†, 230† (305); III., 41† (40), 149† (191); IV., 10†, 240† (313), 252†; V., 14† (20), 38† (24), 190† (284), 191† (251). Females, I., 117† (279); IV., 81† (105), 132† (249).

With Aphonia—Males, II., 40†.

With Bedsores—Males, II., 40†.

With Boils—Males, II., 40†.

With Bronchitis (severe)—Males II., 40†; V., 191† (251).

With Epistaxis—Males, II., 230† (305); IV., 240† (313).

With Hæmorrhage—Males, I., 243† (278); II., 40†, 230† (305); III., 41† (40), 149† (191); IV., 240† (313), 252†; V., 38† (24), 190† (284). Females, IV., 81† (105).

With Dilated Heart—Males, II., 40†.

With Hemiplegia—Males, II., 40†.

With Nephritis—Males, IV., 10†.

With Otitis Media—Males, V., 14† (20), 190† (284), 191† (251).

With Otorrhœa—Males II., 40†.

With Perforation of Intestine—Males, I., 49†?; II., 230† (305); III., 41† (40), 149† (191); IV., 240† (313); V., 190† (284), 191† (251). Females, I., 117† (279); IV., 81† (105), 132† (249).

With Pleuritic Effusion—Males, V., 14† (20).

With Pneumonia—Males, IV., 252†.

With Broncho-Pneumonia—Males, V., 191† (251).

With Pyæmia—Males, II., 40†.

With Relapse—Males, II., 40†. Females, IV., 81† (105).

With Rigidity—Males, IV., 252†.

With Rigors—Males, V., 38† (24).

With Ulceration of Larynx—Females, IV., 132† (249).

RECOVERIES—Males, I., 5, 6, 15, 34, 43, 89, 135, 144, 165, 189, 197, 204, 206, 224, 247, 248; II., 7, 8, 51, 57, 89, 124, 160†, 180, 205, 216, 246; III., 4, 18, 21, 24, 34?, 61†, 74, 126, 170, 172†, 176, 187†, 195†, 210, 217; IV., 1, 7, 19, 22, 30, 31, 39, 51, 63, 81, 139, 160, 161, 162, 182, 188, 190, 197, 207, 210, 214, 217, 221, 229, 235; V., 32, 37, 79, 113, 144, 145, 169, 175, 186, 206. Females, I., 3, 6, 38, 40, 125, 130; II., 2?, 5, 28, 38, 49, 51, 55?, 70, 76, 91?, 159, 166, 168, 178, 183, 190; III., 9, 19, 123, 128; IV., 7, 15, 41, 50, 51, 58, 58A, 87, 114, 135, 158, 175; V., 36, 41, 116, 125, 140, 150, 159, 166.

With Abortion—Females, II., 168, 183.

With Aphasia—Females, II., 91?

With Arteritis—Males, II., 124.

With Bedsores—Males, III., 24.

With Boils—Males, I., 34.

With Bronchitis (severe)—Males, I., 34; II., 246; III., 21; IV., 7; V., 79. Females, II., 38, 76, 178, 183, 190; III., 4, 9, 51, 87, 135; V., 41, 140.

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SURGICAL REPORT.

PREFACE TO THE SURGICAL REPORT.

The general arrangement of the Statistical Tables is the same as in previous years.

Table I. comprises all patients who left the surgical wards during the year ; each patient appears in this Table once only ; cases in which two or more injuries or diseases occurred in the same patient are entered only under the principal disease or injury. In the Library is kept a manuscript index in which all injuries and diseases are entered, irrespective of the number of patients. Thus, a patient with fracture of the base of the skull, fracture of the clavicle, and dislocation of the elbow would be entered in Table I. under the first heading only, but in the manuscript index under all three.

Table II. includes all operations upon the patients in Table I., and also operations performed upon patients in the gynæcological and medical wards.

In the Appendices, the references to the volume and number of the notes of each case have again been inserted, as was done last year.

The bound volumes of notes are kept in the Library.

Showing the Total Number of Cases under Treatment during the Year 1897, with the comparative Frequency and Mortality of each Disease at different Ages.

DISEASE.	Total.	Discharged.		Died.	Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
		Discharged.			Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		
		M.	F.		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
DISEASES.																							
GENERAL DISEASES.																							
Deaf Mutism	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erysipelas—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Cutaneous</i>	8	3	5	...	...	...	...	...	...	...	1	...	3	...	1	...	1	...	...	...	2	...
<i>Phlegmonous Erysipelas</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>and Cellulitis</i>	25	18	7	...	...	1	4	...	...	...	4	1	5	...	2	1	1	...	2	...	3	1
Gangrene—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Idiopathic</i>	7	1	1	4	1	1	...	...	...	...	...	...	1	...	1	...	...	...	1	1	...	2
<i>Traumatic</i>	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Glanders	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Hæmophilia...	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Hæmorrhage	2	1	1	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...
Hydrophobia	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Parasites—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Hydatids</i>	3	1	2	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Septicæmia and Pyæmia	4	...	1	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...
Tetanus	4	3	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	2	...	...	...

TABLE I. (continued)

DISEASE.	Total		Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 25.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	M.		F.		M.		F.		M.		F.		M.		F.		M.		F.		M.		F.		M.		F.	
	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.		
VENEREAL DISEASES.																												
Constitutional Syphilis—																												
<i>Tertiary</i> ...	7	6	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	3	1	...	...	...	...	...	...
Congenital Syphilis	...	2	2	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TUMOURS.																												
Epithelioma—																												
<i>Bladder</i> ...	9	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1	...
<i>Cheek</i> ...	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...
<i>Ear</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
<i>Floor of Mouth</i> ...	8	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	5	...	...
<i>Forearm</i> ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Glands</i> ...	11	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...
<i>Hand</i> ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
<i>Jaw (Upper)</i> ...	10	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>" (Lower)</i> ...	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Larynx</i> ...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...
<i>Lip</i> ...	13	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
<i>Nose</i> ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Oesophagus</i> ...	13	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...
<i>Palate</i> ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
<i>Penis</i> ...	8	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...
<i>Pharynx</i> ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (continued).

[illegible]

TABLE I. (continued).

DISEASE.	Total.	Discharged.		Died.	Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
		M.	F.		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	
TUMOURS (continued).																							
Sarcoma (continued)—																							
Chest Wall	1	1	1	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...
Foot	2	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Forearm	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2
Glands	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Groin	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kidney	6	1	5	...	...	...	...	...	...	...	1	...	1	...	...	...	...	3	...	1	...	...
Leg	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Liver	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mediastinum	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mesentery	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Muscles	3	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nasal Septum	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ovary	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Parotid	4	1	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Perineum	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Scalp	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Synovial Membrane of																							
Knee	2	2	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
Testis	3	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Lymphosarcoma	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cysts—																							
Blood Cyst	2	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	2	...	...	...	...
Breast	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (continued).																							
Papilloma (continued)—																							
Face	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gum	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lip	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thumb	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Toe	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tongue	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Polypus—																							
Ear	9	6	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nose	6	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rectum	5	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thyroid—																							
Adenomatous	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cystic	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Parenchymatous	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malignant	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MALFORMATIONS AND DEFORMITIES.																							
Anus Imperforate	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Branchial Cleft Persistent	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate...	25	14	11	...	7	6	...	3	2	...	2	2	...	1	1	...	...	...	...	...	...	...	...
Congenital Dislocation of—																							
Hip	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patella	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (continued).

[illegible]

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
MALFORMATIONS AND DEFORMITIES (<i>continued</i>).																					
Talipes (<i>continued</i>)—																					
<i>Calcaneus</i> ...	3	2	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Equinus</i> ...	7	5	2	...	1	...	1	...	1	...	1	2	...	...	...	...	...	...	...	1
<i>Equino-Varus and Varus</i>	8	6	2	...	3	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
<i>Planus</i> ...	2	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Webbed Fingers ...	1	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Wry Neck ...	9	8	1	...	4	...	2	1	...	1	...	1	...	...	...	...	...	...	...	...
DISEASES OF THE NERVOUS SYSTEM.																					
Cerebellar Tumour ...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cerebral or Cerebellar Abscess ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coccydynia ...	1	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Epilepsy ...	4	4	...	...	...	...	...	...	...	...	...	...	1	...	1	...	2	...	...	...
Hysteria ...	6	3	3	...	1	...	...	...	1	2	...	1	1	...	...	...	...	...	...	...
Malingering ...	3	1	2	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...
Meningitis ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Neuralgia ...	4	2	2	...	...	...	...	...	...	...	...	...	...	1	...	...	1	2	...	...
Neuro-mimesis ...	2	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Paralysis—																					
<i>Infantile</i>	5	3	1	...	1	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...
<i>Sciatica</i> ...	2	1	1	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...
Vertigo ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...

TABLE I. (continued).

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE EYE.																				
Conjunctiva—																				
Conjunctivitis ...	15	5	2	1	1	...	2	...	2	3	...	3	1	...	...	...	...	...	...	...
Episcleritis ...	1	1	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Herpes ...	2	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonorrhœal Ophthalmia	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...
Pterygium ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cornea and Sclerotic—																				
Hyphæma ...	5	2	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
Keratitis ...	39	24	5	1	5	5	2	4	1	...	2	1	...	2	...	...	...	1	...	...
Interstitial Keratitis	10	3	...	...	1	1	1	2	...	2	1	1	...	1	...	...	...	2	3	...
Opacities ...	8	5	...	...	1	...	1	...	1	1	1	1	...	...	1	...	...	1	...	...
Staphyloma ...	4	1	1	...	1	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...
Ulcer ...	56	29	8	5	3	6	3	3	3	3	1	2	6	4	3	3	2	...	1	...
Sacmesh's Ulcer	2	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Iris—																				
Iritis ...	18	12	...	...	1	...	...	...	1	...	2	2	...	...	1	1	...	...	1	1
Irido-Cyclitis ...	2	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Kerato-Iritis ...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Lens—																				
Aphakia ...	3	2	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
Capsular Opacities	10	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	5
Cataract (hard)	57	27	...	...	...	...	...	...	...	...	...	...	1	3	...	...	4	4	...	19
" (soft)	13	10	1	...	2	...	1	...	1	...	6	...	...	2	...	...	...	...	...	21
" (polar)	3	3	1	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...
" (traumatic)	13	12	...	...	3	1	4	...	...	...	2	...	...	...	1	...	...	...	...	...

TABLE I. (continued).

[illegible]

DISEASE.	Total.		Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	M.	F.	M.	F.	M.	F.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
DISEASES OF THE EYE (continued).																								
Diseases of the Orbit	2	2	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
(continued) —	2	1	1	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Hemorrhage into Orbit	2	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Sarcoma	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Ocular Paralysis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DISEASES OF THE EAR.																								
Auditory Vertigo	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Foreign Body in Ear	1	1	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Otitis Interna	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Otitis Media	59	31	25	2	1	1	4	4	6	3	12	5	3	3	4	5	1	1	1	4	..	..	..	1
Otorrhea	..	3	3	..	..	..	1	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..
DISEASES OF THE NOSE AND ANTRUM.																								
Chronic Rhinitis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Deformity of Nose	..	2	1	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Deviated Septum	5	2	3	..	..	..	..	..	1	1	..	1	1	..	1	..	..	1	..	..	..	..	..	..
Empyema of Antrum	2	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Empyema of Frontal Sinus	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Epistaxis	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Syphilitic Destruction	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..
Tuberculous Disease of Septum	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..

[illegible]

TABLE I. (continued).

DISEASE.	Total.																				
	Discharged.		Died.	Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE LYMPHATIC SYSTEM (continued).																					
Glands (continued) —																					
Tuberculous —																					
<i>Acilla</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Groin</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Mesentery</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Neck</i> ...	41	16	25	...	...	...	...	9	...	6	...	41	...	3	1	...	1	...	...	...	...
Lymphatics —																					
Lymphangitis —																					
<i>Arm</i> ...	1	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Leg</i> ...	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Spurious Elephantiasis and Chronic Edema	5	2	2	...	...	...	...	...	...	...	...	1	...	2	1	...	...	...	...	...	...
DISEASES OF THE DIGESTIVE SYSTEM.																					
Lips —																					
Hypertrophy of Lower...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mouth —																					
<i>Cancerum Oris</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Closure of Jaws</i>	2	...	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Hæmorrhage from Gums</i>	1	...	1
<i>Ranula</i> ...	1	1	1

TABLE 1. (continued).

[illegible]

TABLE I. (continued).

[illegible]

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[illegible]

TABLE I. (continued).

[illegible]

TABLE I. (continued).

DISEASE.	Total.	Discharged.		Died.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
		M.	F.	M.	F.	Discharged.	F. M.	Discharged.	F. M.	Discharged.	F. M.	Discharged.	F. M.	Discharged.	F. M.	Discharged.	F. M.	Discharged.	F. M.	Discharged.	F. M.
DISEASES OF THE GENITO-URINARY ORGANS (contd.).																					
Spermatic Cord—																					
<i>Encysted Hydrocele</i> ...	4	4	...	...	...	1	...	1	...	1	...	1	...	1	...	...	...	...	...	...	...
<i>Hæmatocele</i> ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Variocoele</i> ...	41	...	...	...	...	...	...	1	...	14	...	24	...	2	...	1	...	...	...	...	...
Testis—																					
<i>Orchitis and Epididymitis</i> ...	4	4	...	...	...	...	...	...	...	2	...	2	...	...	...	1	...	...	...	...	...
<i>Retained Testis</i> ...	11	11	...	...	...	1	...	2	...	4	...	2	...	...	...	...	...	...	...	...	...
<i>Syphilitic</i> ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
<i>Tuberculous</i> ...	11	11	...	...	...	1	...	...	...	1	...	5	...	2	...	2	...	...	...	...	...
<i>Tunica Vaginalis—</i>																					
<i>Hæmatocele</i> ...	9	9	...	...	...	...	...	...	...	1	...	1	...	2	...	3	...	1	...	1	...
<i>Hydrocele</i> ...	19	19	...	...	...	2	...	1	...	2	...	4	...	2	...	5	...	1	...	1	...
Ureter—																					
<i>Calculus in</i>	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Urethra—																					
<i>Caruncle</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
<i>Calculus</i> ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Stricture</i> ...	30	29	...	...	...	...	...	1	...	1	...	2	...	11	...	6	...	6	...	2	...
Urine and Urination—																					
<i>Dysuria</i> ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
<i>Extravasation</i> ...	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	...	...
<i>Hæmaturia</i> ...	10	6	4	...	...	...	...	1	...	...	...	3	...	1	...	1	...	...	...	1	...

TABLE I. (continued).

DISEASE.	Total.																						
	Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	M.	F.	M.	F.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	
DISEASES OF THE GENITO-URINARY ORGANS (<i>contd.</i>).																							
Urine and Urination																							
(continued)—																							
Incontinence	4	1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Pyuria	2	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Retention	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uterus and Appendages—																							
Leucorrhœa	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Miscarriage	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Missed Abortion	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vulva and Vagina—																							
Noma Vulvæ	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vulvitis	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ruptured Perineum	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Breast—																							
Chronic Mastitis	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Galactocœle	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercle	2	
DISEASES OF THE ORGANS OF LOCOMOTION.																							
Bone : Diseases of—																							
Caries—																							
Malar	1	

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DISEASE.	Total.	Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
		M.	F.	M.	F.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
DISEASES OF THE ORGANS OF LOCOMOTION (<i>continued</i>).																							
Bone : Diseases of (<i>contd.</i>)—																							
Caries (<i>continued</i>)—																							
Os Calcis	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Patella	2	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pelvis	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rib	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spine	39	29	1	..	..	6	1	1	7	2	3	2	1	..	3	3	..	5	4	..	..	..	..
Tarsus	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Necrosis—																							
Femur	19	9	8	1	..	1	..	1	1	1	1	4	..	2	1	..	2	1	1	..	..	..	..
Fibula	2	1	1	..	..	..	..	1	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..
Humerus	4	2	2	..	..	..	..	..	..	1	..	1	..	1	..	..	1	..	..	..	..	..	..
Jaw Bones	9	8	1	..	..	2	..	4	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..
Os Calcis	2	2	2	..	..	..	..	..	..	1	..	..	..	1	..	..	2	..	..	..	..	..	..
Pelvis	3	3	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Phalanx	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Rib	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Scapula	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Skull	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Tibia	8	4	2	..	..	1	..	1	1	2	..	1	1	..	1	1	..	..	..	..	..	..	..
Ulna	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Periostitis and Osteitis—																							
Femur	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..

TABLE I. (continued).

[illegible]

TABLE I. (*continued*).

DISEASE.	Total.	Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.			
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
DISEASES OF THE ORGANS OF LOCOMOTION (<i>continued</i>).																			
Joints :																			
Ankylosis—																			
Ankle	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Elbow	3	1	2	...	1	1	...	1	...	...	...	1	...	...	...	...	...	...
Hip	5	3	2	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...
Knee	6	2	4	...	...	1	...	...	...	1	2	...	...	...	...	...	...	...
Multiple	2	1	1	...	...	...	...	1	...	1	...	...	...	...	...	1	...	1
Shoulder...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Charcot's Disease—																			
Ankle	2	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Hip	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Knee	2	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
Tuberculous Disease—																			
Ankle	9	4	2	...	...	1	...	2	1	...	1	...	1	1	...	...	...	...
Elbow	17	6	11	...	2	...	...	...	6	...	...	1	1	...	1	...	...	...
Hip	51	27	21	...	10	4	...	4	4	...	3	2	...	...	...	...	...	...
Knee	47	21	25	...	3	4	...	3	2	...	5	8	...	...	...	...	...	...
Metatarsus	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
Sacro-Iliac	5	3	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Shoulder	3	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1
Tarsus	15	11	3	...	1	1	...	1	...	3	1	1	...	1	...	
Wrist	5	5	5	2	
Gonorrhoeal Arthritis	7	

TABLE I. (continued).

[illegible]

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[illegible]

[illegible]

TABLE I. (*continued*).

DISEASE.	Total.		Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE CUTA- NEOUS SYSTEM (<i>continued</i>).																								
	Lupus—																							
	Face ...	11	...	11	...	...	...	...	...	...	...	...	...	2	...	5	...	3	...	...	1	...	...	...
	Lower Extremity	3	2	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
	Nails—																							
	Onychia ...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
	Ingrowing Toe-nail	2	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...
	Scars—																							
	Contracted	8	3	5	...	1	...	...	...	...	1	...	...	3	...	2	...	...	...	...	...	...	...	...
	Keloid ...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nerves involved in	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
	Ulcers—																							
	Chronic and Varicose	7	4	3	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	1	...	1	...	1
	Perforating	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Syphilitic	4	2	2	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	2	...	...	...	...
	Tuberculous	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
	Mole—																							
	Face ...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Hairy ...	3	...	3	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...
INJURIES.																								
	Burns	30	12	12	4	2	1	7	4	...	2	...	1	1	...	2	2	...	1	2	...	...	1	...
	Scalds	33	13	17	1	2	8	11	1	2	...	1	1	1	...	1	3	...	...	...	...	...	...	...

TABLE I. (continued).

INJURY.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Discharged.				Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
INJURIES OF THE THORAX.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

INJURY.	Total.	Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
		M.	F.	M.	F.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
INJURIES OF THE BACK (continued).																							
Fracture—dislocation of Spine—																							
<i>Cervical</i> ..	5	2	..	3	..	..	..	..	..	..	..	1	..	..	..	1	..	1	..	..	..	1	..
<i>Dorsal and Dorso-</i>																							
<i>Lumbar</i> ..	3	..	..	3	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..
Fracture Spinous Process ..	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
INJURIES OF THE PELVIS AND GENITALS.																							
Contusions ..	5	..	5	..	..	1	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..
Wounds—																							
<i>Contused</i> ..	2	..	2	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..
<i>Lacerated</i> ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Fractures ..	13	6	2	4	1	..	..	..	..	..	..	..	..	..	..	2	1	2	2	..	..	2	1
Old Fracture of Pelvis ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Rupture of Urethra ..	3	3	..	..	..	..	..	1	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..
INJURIES OF THE UPPER EXTREMITY.																							
Contusions ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Foreign body in ..	3	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..
Wounds—																							
<i>Gunsnot</i> ..	4	3	1	..	..	..	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..
<i>Incised</i> ..	2	..	2	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..
<i>Lacerated</i> ..	22	19	3	..	..	..	..	2	1	..	..	3	..	5	2	6	..	1	..	..	..	2	..

INJURY.	Total.	Discharged.		Died.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE LOWER EXTREMITY (<i>continued</i>).																							
Fractures (<i>continued</i>)—																							
(Compound)—																							
Femur—																							
Shaft	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia and Fibula	20	15	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Toes	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Old)—																							
Femur (Neck)	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" (Shaft)	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patella	13	6	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia and Fibula	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pott's	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Dislocations)—																							
(Simple)—																							
Semilunar Cartilage	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patella	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Compound)—																							
Toe	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Trivial Cases Unclassified	29	16	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

ABSTRACT OF TABLE I.,

With Average Duration of Surgical Patients in the Hospital.

Discharged, Cured or Relieved	$\left\{ \begin{array}{l} \text{M. 2,255} \\ \text{F. 1,491} \end{array} \right\}$	3,746
-------------------------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	--	-------

Died	$\left\{ \begin{array}{l} \text{M. 145} \\ \text{F. 74} \end{array} \right\}$	219
------	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	-----

*Remaining in, December 31st, 1897 :—

Male	170	} 272
Female	102	

Average stay of Men	26.17 days
---------------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------------

„	Women...	25.94	„
---	----------	-----	-----	-----	-----	-----	-----	-----	-----	-------	---

* These cases are not included in Table I. or II.

APPENDIX TO TABLE I.

In this Appendix, reference is made only to cases in which no operation was performed; operation cases are described separately in the Appendix to Table II. All fatal cases and most of the more important of the other cases are described in one or other of these two Appendices.

GENERAL DISEASES.

Addison's Disease.

The case of a boy, aged 15, admitted with tuberculous disease of the tarsus, who died of Addison's Disease, is described under the former heading. (iii. 2106.)

Erysipelas. (See separate Table, p. 244.)

Gangrene.

IDIOPATHIC.—Seven cases.

Two recovered; one of these was a boy, aged 4, with gangrene of the penis (iv. 2413); the other a woman, aged 54, who underwent amputation. (See Appendix II). Of the remaining five, three men underwent amputation of the leg for gangrene of the foot. (See Appendix II.)

A male infant, aged 21 months, admitted very ill with gangrene about the external ear, but without any history, died two days later. (ii. 2345.)

A woman, aged 63, was admitted very ill with dry gangrene of the left hand and part of the forearm of four weeks' duration. She was suffering also from diabetes. She was very feeble, and rapidly became worse, dying ten days after admission. At the post-mortem, the left subclavian artery and also the radial and ulnar arteries were found completely occluded by a thrombus (? embolic). There was much atheroma of the arteries, but no valvular disease of the heart. (v. 2432.)

There were also in the surgical wards two medical cases not in Table I.; one, a man, aged 83, with senile gangrene of the foot and senile dementia, was transferred to an Infirmary, no operation being deemed advisable. (v. 597.) The other was a woman, aged 22, with gangrene of both feet after typhoid fever; the case is described fully in Appendix II. under amputation. (ii. 2679.)

TRAUMATIC.—All three cases were of the finger, and amputation was performed.

There was another remarkable case of traumatic gangrene, which appears in Table I. under talipes, and is fully described in Appendix II. under excision of the astragalo-scapoid joint. (i. 334, p. 174.)

Glanders.

A painter, aged 37, who had been under treatment for many years at various hospitals for tertiary syphilis, but whose work, as far as could be ascertained, had not brought him into contact with horses, was admitted with what at first seemed to be a simple cellulitis of the face. This had existed nine days. The patient on admission was obviously ill; his temperature was 100°; besides the cellulitis he had a slight pustular eruption about the face. He became rapidly worse, the temperature rose to 105°, a profuse discharge of mucus from the nostrils set in, parts of the skin of the face became gangrenous, and several small hard tubercles appeared in various parts of the skin of the limbs. He died on the fifth day after admission. The post-mortem showed typical glanders, the lungs being studded with numerous characteristic tubercles, and bacteriological examination showed the bacillus mallei. (iv. 2991.) (The case has been fully described in the Transactions of the Pathological Society.)

Hæmophilia.

A tailor, aged 17, was admitted with a considerable tender swelling about the elbow and an indefinite history of hæmophilia; the swelling, which was thought to be inflammatory, was punctured, but only blood escaped; bleeding continued for several days, but the wound then healed and the patient made a good recovery. (i. 2990.)

Hæmorrhage.

A woman, aged 35, had been in a medical ward for ascites, and had there been tapped. She was discharged four days afterwards, but two days later she returned very anæmic, with continuous oozing of blood from the wound. An incision was made into the abdominal wall and some bleeding points secured. A good recovery followed. (v. 924.)

Hydrophobia.

A bank clerk, aged 36. Forty-eight days before admission he had been bitten on the ear by a pet dog, which had soon afterwards shown characteristic symptoms of rabies. Two days before admission the patient began to feel ill; next day he began to have spasms during deglutition. After admission he grew rapidly worse and died paralysed on the following day. A rabbit, inoculated from his spinal cord, died on the fourteenth day, of paralytic rabies. (i. 2885.)

Lardaceous Disease.

There were six cases, one male, aged 21, and five females, aged 14, 17, 9, 10 and 16, admitted for sacro-iliac disease, tuberculous pyo-nephrosis, necrosis of the femur, and hip disease (three cases) respectively. (The cases appear in Table I. under these various headings.)

Tetanus.

Four patients, all males, were admitted.

One died.

A leather porter, aged 29. Fourteen days before admission he had run a nail into the sole of his foot; he was wearing boots at the time; eleven days later he first noticed stiffness of the neck. On admission he had well-marked tetanus with frequent spasms and marked risus sardonius. Injection of tetanus antitoxin (1 to 2 grammes daily) was commenced at once. Chloral bromide and morphia were also given. The spasms continued for eight days, then diminished considerably; on the eighth day a tender swelling was noticed below one ear; it was thought to contain pus, but an

incision gave a negative result. The patient now became delirious and gradually sank, dying on the tenth day after admission. The temperature, 100° on admission, rose steadily to over 104° shortly before death. The post-mortem showed no evidence anywhere of suppuration, and bacteriological cultures from the blood, lung, liver, kidney, and spleen were quite sterile. (ii. 2066.)

Three patients recovered.

A coppersmith, aged 19. Twenty-five days before admission he had received a graze on the elbow while playing football; twelve days later, stiffness about the neck and jaws was first noticed. On admission there was general rigidity, with well-marked risus sardonius and occasional attacks of slight opisthotonos. He was treated with calomel, chloral, bromide and injections of Tizzoni's antitoxin. The latter was given in doses of from $\frac{1}{2}$ to 1½ grammes, at first three times a day, then twice, and finally once a day, and its administration was discontinued after the seventh day. The patient, steadily improved, and was quite well when he left the hospital on the thirtieth day. (iv. 3012.)

A bookmaker, aged 51. There was no history of any injury, but there were several slight abrasions on the fingers and toes, together with some soft corns. Eight days before admission he had first noticed stiffness about the jaws; he had been getting gradually worse. On admission he presented typical signs of tetanus and was unable to open his mouth more than a quarter of an inch. He was treated by injections of 5 cc. ($\frac{1}{2}$ gramme) of Tizzoni's antitoxin twice daily for several days. From the third day he began to improve, and left the hospital thirty-five days after admission, quite well. (iv. 1665.)

A labourer, aged 52, was admitted four days after having lacerated his hand with a piece of granite. For two days he had been unable to open his mouth. He had distinct risus sardonius, rigidity of the abdominal and other muscles, and occasional mild tetanic spasms. He was injected with $\frac{1}{2}$ to 1 gramme of antitoxin for three successive days. The spasms then ceased and he steadily improved, and was quite well when he left the hospital on the twenty-ninth day after admission. (v. 183.)

VENEREAL DISEASES.

Among the very few patients admitted for these, there were no deaths.

TUMOURS.

Carcinoma.

BLADDER.—Of nine patients admitted for carcinoma of the bladder, two underwent no operation; one was a man, aged 62, in whom the disease was too extensive for treatment (v. 658); the other was a woman, aged 60, who had been in the hospital nine months previously, when a small villous carcinoma had been removed by suprapubic cystotomy; on admission the second time recurrence was too extensive to permit of further operation. (iii. 2498.)

LARYNX.—Of three cases, two were discharged as unfit for operation; the third underwent tracheotomy and subsequently died in the hospital. (See p. 196, v. 125.)

ŒSOPHAGUS.—Of eleven patients admitted, one underwent gastrostomy and died; most of the others were treated by some form of tubage; two were in the hospital twice; three died.

The three fatal cases were:—

An indiarubber worker, aged 51, had suffered for two months from dysphagia and emaciation; there was a stricture thirteen inches from the teeth,

and signs of consolidation of part of one lung ; he gradually sank and died twenty-four days after admission. (v. 3328.)

A bookkeeper, aged 52, with symptoms of six months' duration, was admitted in a moribund condition with a pneumothorax ; he died in three days, and the post-mortem showed an epitheliomatous stricture three inches from the stomach ; there were no secondary growths. (iv. 1076.)

A cellarman, aged 58, with symptoms of four months' duration, was admitted very ill with pneumonia, and died on the seventh day. The post-mortem showed the very unusual condition of three distinct deposits of epithelioma in the œsophagus, one opposite the cricoid and the others respectively five and seven inches below this. (v. 3027.)

SCROTUM.—Of the two patients with this disease, one was a chimney sweep, the other had been a pitch porter for more than twenty-five years ; in the case of the latter patient the disease was too extensive for any operation. (iii. 570.)

TONGUE.—Eighteen men and one woman were admitted.

One of these was in the hospital three times during the year. Five men and one woman underwent no operation, the disease being too extensive. (i. 1988, iii. 1747, iv. 885 and 1863 ; (female) v. 1226.)

A soldier, aged 86, who had been in the hospital eight years previously, and had had the anterior half of the tongue removed at that time for epithelioma, was readmitted and was found to be in excellent health, with no recurrence. (ii. 448.)

Three men, aged 56, 58 and 67, underwent local removal of the growth. (ii. 591, iv. 2319 and 1392.)

One man, aged 59, who was admitted thrice (and who had also been operated upon in the previous year) underwent on the first two occasions local removal of the growth which was situated far back close to the anterior pillar of the fauces ; on the third occasion a more extensive operation was performed, part of the jaw being also removed. (ii. 2102, 2482, and 3014.)

The other eight patients underwent removal of half the tongue. There were no deaths among any of the nineteen patients.

STERNUM.—This was a somewhat peculiar case. A man, aged 62, was admitted on account of a rounded soft elastic swelling springing from the upper part of the front of the sternum. It had been growing slowly for eight weeks. When cut into, some dark blood and soft growth were removed ; the latter proved microscopically to be columnar-celled carcinoma. The tumour was evidently a secondary growth, but no indication of a primary growth could be discovered anywhere. The patient left the hospital six weeks later in much the same state as on admission. (ii. 2669.)

BREAST.—Of seventy-two patients admitted for cancer of the breast, three underwent no operation, and left the hospital a few days after admission. The eight patients admitted for recurrent carcinoma all underwent further operations.

GALL BLADDER AND DUCTS.—A woman, aged 55, had had for four years more or less continuous pain in the region of the gall bladder ; in the last six months it had been much worse. On admission, the abdomen was much distended and the liver considerably enlarged. Soon after admission jaundice and vomiting set in and the patient rapidly sank, dying on the eighteenth day. The post-mortem showed a carcinomatous tumour of the cystic duct and numerous calculi in the gall bladder. (i. 2088.)

COLON OR SIGMOID FLEXURE.—Fourteen patients were admitted; of these, four men and two women underwent inguinal colotomy, two of the men and one woman dying after it; in all these cases there was more or less intestinal obstruction before operation. (Male, ii. 1333, iii. 2693, v. 1067 and 2772; Female, ii. 1444, and v. 1280); two men and one woman underwent a simple exploratory abdominal section, nothing further being done; these recovered and soon left the hospital (Male, ii. 329 and 1683; Female, ii. 1618); one woman underwent exploratory abdominal section and, subsequently, enterotomy; she died (v. 1546). (For details of all these operation cases, see Appendix II.)

Two men and two women underwent no operation; of these, two men left the hospital a few weeks after admission (iv. 418, 2021); the two women died.

One was a woman, aged 58, who was admitted moribund with a distended abdomen and a history of ten days absolute constipation, four days vomiting, and one day faecal vomiting. No operation would have been of the least use, and she died a few hours after admission. The post-mortem showed a small tight carcinomatous stricture of the sigmoid flexure. There was no perforation or peritonitis, and there were no secondary growths anywhere. (ii. 1264.)

The other was a stout woman, aged 62, admitted on account of fæcal fistulæ, one close to the umbilicus, the other three inches to the left of it. The history was that about a year previously she had first noticed a lump above the umbilicus. This was very painful and soon burst externally, discharging pus and afterwards fæces, fishbones, &c. The patient did not emaciate, and on admission her general health seemed good, although she was in much local distress from the fistulæ, through which there was at first profuse discharge. Under careful local treatment the fistulæ became much smaller. Under an anæsthetic a thorough examination was made with the finger, and a mass of colloid carcinoma was scraped away from the central fistulous opening. Nothing more was done, and the patient gradually sank and died three months after admission. The post-mortem showed a comparatively small carcinomatous growth in the transverse colon. This had perforated the colon and set up a localised abscess between it and the abdominal wall. The abscess had then burst through the skin in two places. There were adhesions only in the immediate neighbourhood of the growth; there were no secondary deposits in the glands or viscera. Microscopically, the growth was a cylindrical celled carcinoma. (iv. 1490.)

CÆCUM.—This case was that of a man, aged 58, who had a small hard lump in the right iliac fossa. It was believed to be malignant, but there was some doubt about the diagnosis, a simple chronic appendicitis being also suggested. The patient left the hospital four weeks after admission. (i. 1231.)

ORBIT.—A farm labourer, aged 61, whose case is described in the Report for 1895, page 146, was readmitted with recurrence in the nose and orbit; no further operation was performed.

PROSTATE.—A clergyman, aged 58, had had dysuria and occasional hæmaturia for three months, the latter being the first symptom. He was admitted in great pain with cystitis and retention. Some foul urine was drawn off; he gradually sank and died on the fourteenth day. The post-mortem showed an extensive carcinomatous growth in the prostate, with cystitis and acute pyelo-nephritis; the latter was the immediate cause of death. (v. 2640.)

RECTUM.—Of thirty-five patients, thirty underwent colotomy; of these, two died. Seven underwent excision of the rectum, and one local removal of a small recurrent growth; all these recovered.

Eight men and six women underwent no operation. (Male, i. 25, 526, 2692, ii. 1205, iii. 2361 and 2381 iv. 2081, v. 1050; Female, i. 19, 27, 526, ii. 1030 2352, (v. 659.)

STOMACH.—Two men and four women were admitted (one was in twice) ; one man and three women underwent gastro-enterostomy.

A man, aged 63, was admitted very feeble and ill with dysphagia. There was a history of his having accidentally swallowed a teaspoonful of carbolic acid three months before, and the dysphagia had dated from that time ; he himself was of opinion that his emaciation had begun long before. A bougie was being passed to examine the œsophagus when the patient suddenly died of syncope. The post-mortem showed a small carcinomatous growth of the pylorus, with a large secondary mass of glands compressing and obstructing the lower part of the œsophagus. There was no actual ulceration of the œsophagus itself. (ii. 3152.)

A woman, aged 54, had had symptoms of carcinoma of the stomach for seven months. On admission she was much too ill for any operation ; she gradually sank and died on the seventh day. The post-mortem showed extensive deposits in the stomach and elsewhere. (v. 359.)

UTERUS.—A woman, aged 45, was admitted very ill with extensive carcinoma of the uterus. She gradually sank and died a fortnight later. There was no post-mortem. (iv. 782.)

Sarcoma.

ARM.—A woman, aged 64, who had had a sarcomatous tumour removed from the arm one year previously was readmitted with extensive recurrence ; treatment by Coley's fluid was tried, but the patient soon discharged herself from the hospital ; no improvement took place. (v. 2541.)

BACK.—A woman, aged 49, with an inoperable sarcomatous tumour of the back and axilla of eleven months' duration, was also treated by injection of Coley's fluid ; no benefit, however, was noticeable ; the patient became paraplegic and died seven weeks after admission. (iii. 2029.)

Four patients were admitted for sarcoma of the femur ; one of them was treated by amputation, the others were not.

A man, aged 53, had a very large periosteal sarcoma at the upper and inner part of the thigh ; it had existed three years and was not suited for removal. (i. 654.)

A woman, aged 42, who had been in the hospital some months previously for pyo-nephrosis and had undergone a successful nephrotomy, was readmitted with a large swelling of the opposite femur. An incision and microscopical examination proved it to be malignant ; it was unsuitable for operation. (iii. 2157 ; see also p. 199, iii. 296.)

A boy, aged 18, was admitted with what was at first supposed to be tuberculous hip disease of three weeks' duration. He had pain in the hip and knee ; the hip was stiff, painful and tender, and there was some ill-defined swelling about the hip ; the thigh was flexed and abducted, the muscles wasted ; the temperature was normal. He was treated by rest and extension, and then allowed to get about on crutches. Three weeks after admission he fell upon the hip ; much increase of pain and swelling followed, and it soon became evident that the femur was fractured. Three months later a distinct swelling appeared at the upper outer and anterior part of the thigh. This was at first thought to be an abscess, but puncture on two separate occasions yielded only a little blood. It now became evident that the case was one of sarcoma of the upper end of the femur. The swelling gradually increased, there was much pain, the boy gradually emaciated, and finally died eight months after

admission. The post-mortem showed a large very soft sarcoma of the upper third of the femur, with secondary growths in the chest and abdomen. There was some ulceration of cartilage in the hip joint. (i. 1406*.)

STERNUM.—A man, aged 43, had been ill for six months with enlarged glands in the neck and emaciation. He gradually got weaker and died on the eighteenth day. The post-mortem showed a primary sarcoma of the sternum, with secondary deposits in various glands. (iii. 3458.)

KIDNEY.—A woman, aged 41, was admitted with a very large renal tumour of three months' duration. There had never been any hæmaturia. Puncture gave exit only to a little blood. At consultations it was unanimously agreed that the case was one of malignant disease, unfit for operation. She was again in the hospital on two subsequent occasions, six and eleven months later. On the last occasion, she was treated with Coley's fluid, but without any benefit. She eventually died at home, fifteen months after the tumour had been first noticed. A post-mortem made at home showed that the disease was pyonephrosis with a very thick wall. (iii. 2877*, 1219 and 1964.)

LUNG.—An actor, aged 29, had had for several months vague symptoms of indigestion, together with emaciation. On admission he was found to have a large firm fixed irregular tumour in the upper part of the abdomen, evidently malignant. A few days after admission he developed facial erysipelas, and died of syncope a few hours later. The post-mortem showed a primary sarcoma of the lung with a large mass of lumbar glands. There was also recent peritonitis. (iii. 3463.)

A boy, aged 13, who had had his leg amputated earlier in the year for sarcoma of the tibia, was readmitted very ill, and died within an hour. The post-mortem showed extensive deposits of sarcoma in both lungs. (v. 2453.)

MEDIASTINUM.—A man, aged 66, was admitted with a large sarcomatous tumour of the mediastinum, rising into the neck and causing severe attacks of dyspnœa. The symptoms had existed about four months. On the fourth day after admission the patient was suddenly seized with intense abdominal pain and collapse, and died four hours later. The post-mortem showed, besides the sarcoma, a simple chronic ulcer of the anterior wall of the stomach near the cardiac end of the lesser curvature. This had perforated, and thin acrid fluid mixed with lymph was found all over the peritoneal cavity. (v. 2503.)

PAROTID.—A woman, aged 53, was admitted with a large mass of malignant disease in the region of the parotid; it had been first noticed three months previously. No operation was possible. The patient gradually sank and died two months later. (v. 1453.)

Nævus.

NECK.—A feeble female infant, aged thirteen months, was admitted with a large nævus of the neck. On account of the child's feeble condition no operation was performed. It gradually sank and died of broncho-pneumonia six weeks after admission. (iv. 356.)

THYROID TUMOUR.—A laundress, aged 64, had had all her life a large cyst of the right lobe of the thyroid gland. About four months before admission the tumour began to increase in size and to spread to the left side of the neck. On admission there was a large very irregular swelling, chiefly of the left lobe of the thyroid. There was much pain, but no dyspnœa or dysphagia. The skin was slightly adherent, the carotid artery buried in the tumour, the pupils unequal. Puncture led to the evacuation of a few drams of serous fluid and some blood. No operation was advised, the tumour being obviously malignant and irremovable. The patient went home and died there two months later. (i. 154.)

MALFORMATIONS AND DEFORMITIES.

Cleft palate.

Thirteen male and eleven female patients were admitted (one was in twice); of these, three males and four females underwent no operation. In five male and five female cases the deformity was accompanied by harelip; in eight male and six female cases there was no harelip. All the cases were congenital.

Genu valgum.

Of nineteen cases, eleven were treated by osteoclasia, five by osteotomy, and three underwent no operation.

Hallux valgus.

A man, aged 57, was admitted for an extreme degree of this deformity. Chloroform had been administered on lint in the usual manner for about two minutes, when he suddenly stopped breathing, and in spite of all efforts at restoration, he never breathed again. The post-mortem showed extensive fibroid phthisis and adherent pleura. (i. 2226.)

Hammer toe.

Of twelve cases, seven were treated by amputation, three by excision of the head of the phalanx, and two by division of the lateral ligaments.

Harelip.

Thirteen male and nine female patients were admitted, and operations performed upon all except one female. In nine male and four female cases the malformation was complicated with cleft palate; in four male and three female cases there was no cleft palate.

Spina bifida.

Of four cases of spina bifida, two were treated by excision of the sac and died; a female infant, aged 7 hours, had a spina bifida as large as a hen's egg, in the sacral region; it had burst before admission; this patient was not treated by operation, and died of hydrocephalus three months after admission (iii. 331); the fourth patient left the hospital without undergoing any treatment.

DISEASES OF THE NERVOUS SYSTEM.

Cerebellar abscess.

A female child, aged 3½ years, who had always been delicate, but who had never had otitis media, was admitted with the history that three weeks previously an abscess had been opened on the right side of the occiput near the protuberance. Three days later the child began to have fits, and for these she was admitted to a medical ward and transferred next day to a surgical. The child was then in an irritable semi-conscious condition with double optic neuritis, and apparently quite blind. Temperature was rarely as high as 98°. Pulse about 120°. In the above-mentioned region was a sinus leading to bare occipital bone. The fits occurred once or twice a day and were general, but affected especially the arms and hands and muscles of the back, producing marked opithotonus. There was frequently conjugate deviation of the eyes to the left and occasionally divergent strabismus. There was no retraction of the head. The sinus was kept clean and it rapidly healed. The other

symptoms persisted, and the child grew worse. Three weeks after admission an abscess appeared under the scar. This was opened up and a small hole found to lead into the interior of the skull. Some carious bone was cut away and a probe passed in several directions in search of pus, but none was found. The condition of the child did not improve in the least ; very little discharge came away from the wound. Eight days after the operation, and thirty-one days after admission, the child died. At the post-mortem, the right cerebellar hemisphere was found converted into a large abscess cavity, evidently of some weeks' duration. The drain introduced at the operation was separated from the abscess cavity by not more than a third of an inch of brain tissue. (v. 1649.)

Meningitis.

A ship's carpenter was admitted very ill with meningitis, and died on the following day. Three weeks previously he had received a blow on the head ; four days later a discharge from one ear was noticed. The ear was syringed and he returned to work. During the next fortnight the discharge lessened, but pain in the head set in and gradually became very severe. Vomiting, shivering and delirium then set in, and the temperature rose to 103° on admission. The post-mortem showed general septic meningitis, the cause of which could not be ascertained. There was no fracture of the skull, and the meningitis was apparently not due to the disease of the ear. The latter was of long standing. (iv. 776.)

DISEASES OF THE EYE.

There were no deaths during the year.

DISEASES OF THE EAR.

Of fifty-nine patients admitted for otitis media, twenty-six male and sixteen female patients underwent no operation other than the opening of a mastoid abscess or some similar small local operation ; all of these recovered except one ; this was a woman, aged 63, who was admitted unconscious and very ill with meningitis ; she died on the day after admission, and the post-mortem showed general septic meningitis, due to old suppurative disease of the middle ear. (v. 1995.)

Seven male and nine female patients underwent trephining or erosion of the mastoid ; of these, two male patients died. One female patient underwent trephining of the skull for cerebral abscess, and recovered (see Appendix II.).

For other cases of ear disease not comprised in the above statistics, see Nervous system, Polypus of ear, &c.

DISEASES OF THE LARYNX AND TRACHEA.

Two patients died.

A carman, aged 48, who had had dysphonia for eight months and dysphagia one month, was admitted for recent dyspnoea, and found to have tuberculous laryngitis and phthisis. He died rather suddenly three weeks later with symptoms of pneumothorax. There was no post-mortem. (iv. 2703.)

A labourer, aged 37, had had dysphagia, hoarseness and pain for a fortnight ; he was found to have tuberculous laryngitis. He was treated by painting with lactic acid (15 to 50 p.c. solution). He gradually got worse and died two months after admission. The post-mortem showed extensive phthisis of both lungs. (v. 2935.)

DISEASES OF THE DUCTLESS GLANDS.

Thyroid.

CRETINISM.—A male patient, aged 18, who had been in the hospital many times during the last eight or ten years, and had been greatly improved by thyroid treatment, was again in the hospital for a few days. His general condition was very good. (v. 1327.)

MYXŒDEMA.—A woman, aged 55, who was admitted with carcinoma of the breast, and underwent a successful operation, was the subject of well-marked myxœdema. (iii. 2846*.)

Other thyroid cases are described under tumours (innocent and malignant).

Spleen.

The only case is described in Appendix II. (abdominal section) (iv. 585).

DISEASES OF THE CHEST.

A woman, aged 74, admitted very ill with heart disease and general dropsy, died two days later. There was no post-mortem. (v. 2143.)

PNEUMOTHORAX.—A boy, aged 13, admitted with traumatic pneumothorax caused by an omnibus wheel, made a good recovery. (i. 1734.)

DISEASES OF THE VASCULAR SYSTEM.

Arteries.

ANEURISM (Aortic).—A man with aortic (? innominate) aneurism was in the hospital three times, and was much improved by ligature of the subclavian and carotid arteries. (v. 3246*, 2368, 2691.)

The only other case of aortic aneurism was that of a woman who was in the hospital twice and who made a good recovery after abdominal section and the insertion of silver wire. (iii. 751, 827.)

For details of both these cases, see Appendix II.

ARTERIO-VENOUS ANEURISM OF ORBIT.—A clerk, aged 20, was admitted with a pulsating tumour of the right orbit. Twelve weeks previously he had fallen from a bicycle, striking the right temple; he had been insensible for two hours. Three days later he first noticed pulsation in the orbit, and two weeks before admission the right eye became prominent. There had been no wound or bruising after the accident. It was considered that the symptoms were certainly due to a blood tumour of some kind, but whether in the orbit or behind it, was not clear. The patient was treated for ten days by intermittent pressure upon the carotid, but this had no effect upon the swelling. The patient left the hospital six weeks after admission in much the same condition as on admission. (ii. 2829.)

POPLITEAL ANEURISM.—The only case during the year was that of a slaughterer, aged 47, who was admitted for a recent fracture of the femur. He had been in the hospital in 1895 with a large popliteal aneurism which had undergone spontaneous cure; he was very ill with uræmia at that time. (See 1895 Report, p. 109.) With the exception of the fracture, he seemed perfectly well, and had gained several stone in weight; there was no albuminuria; the aneurism was represented by a small ill-defined hard lump of fibrous tissue. (ii. 1909.)

Raynaud's disease.

A carman, aged 28, had had syphilis eight years ago ; one year ago he first noticed hæmaturia ; four months ago gangrene of the left ear began, and one month ago the right ear became similarly affected. A considerable portion of each ear was gangrenous, but the dead parts separated without any complication, and the patient became an out-patient after a few days. (v. 1203.)

DISEASES OF THE LYMPHATIC SYSTEM.

Spurious elephantiasis.

An Italian woman, aged 49, was admitted on account of spurious elephantiasis of the legs and abdominal wall of many years' duration. These parts were the seat of enormous swelling due to chronic œdema. When the patient was sitting up, the abdomen reached nearly as far as her knees. The patient, who was under the joint care of one of the physicians and one of the surgeons, and was also seen by several of the former, died on the twelfth day after admission. At first there was some suspicion that the case might be one of true elephantiasis, but examination of the blood gave a negative result, and the post-mortem showed simple ascites and chronic œdema due to disease of the heart, lungs and kidneys. (v. 2411.)

DISEASES OF THE DIGESTIVE SYSTEM.

Mouth.

CANCER ORIS.—A female child, aged 1½ years, was admitted very ill with extensive gangrene of one cheek and the lower lip of a fortnight's duration. The child had had measles six weeks previously. No operative interference was deemed advisable. Death occurred on the third day after admission. The post-mortem showed septic inflammation of the lungs. (v. 1745.)

STOMATITIS.—A man, aged 28, was admitted very ill with gangrenous stomatitis. For several weeks he had been feeling ill, and for two weeks he had had swelling of the cheek. A week before admission several teeth had been extracted. Part of the right side of the jaw was necrosed, and the neighbouring soft parts were in a state of very foul ulceration. He was treated with antistreptococcus serum injected every four hours, but he died two days after admission. The post-mortem showed a large soft spleen, infarcts in the lungs and other signs of septicæmia. (ii. 1910.)

Tongue.

GLOSSITIS.—There was one very remarkable case of chronic glossitis in a boy, aged 17, the subject of congenital syphilis. (i. 1560.)

Tonsils.

ENLARGED.—Most of these cases appear in the Statistical Table under ADENOIDS, which co-existed.

Salivary glands.

PAROTITIS.—There were two cases admitted for abscess of the parotid and submaxillary glands respectively. In three other cases, parotitis occurred as a complication of renal calculus, and radical cure of hernia (two cases). (Female, iii. 271 ; Male, iv. 1016, v. 697.)

Stomach.

DYSPEPSIA.—The girl, aged 21, whose case is recorded on p. 196 of last year's Report (successful suture of perforated gastric ulcer), was again in the hospital for a few days, fifteen months after the operation. With the exception of a little dyspepsia, she was quite well. (iv. 943.)

GASTRIC ULCER.—There were eight cases of gastric ulcer. Two of these were perforating ulcers, and were treated by abdominal section and suture of the perforation; one underwent exploratory laparotomy, but no evidence of disease was found; one was admitted for chronic intestinal obstruction, and an exploratory abdominal section was performed. (See Appendix II.) The other four underwent no operation.

A carrier, aged 60, was admitted for hæmatemesis and other signs of gastric ulcer; he made a good recovery. (iv. 3011.)

A nurse, aged 40, was admitted with symptoms of a perforated gastric ulcer. Twenty-one years ago she had had symptoms of gastric ulcer for two years, and had been treated for this. Two days before admission, and four and a half hours after taking food, she had been suddenly seized with violent epigastric pain, followed by collapse and vomiting, then by swelling and tenderness and rigidity of the abdomen. She *immediately* went to bed, and remained there for two days; she was then admitted. On admission her temperature was 103°. There was evidence of local peritonitis in the upper part of the abdomen; this gradually subsided with rest in bed, and the patient left the hospital on the thirty-eighth day, quite well. It was supposed that the peritonitis was connected with the ulceration of the stomach. (i. 264.)

The other two cases appear in the Statistics under diaphragmatic hernia and sarcoma of the mediastinum respectively. (Male, ii. 2906 and v. 2503; Appendix I, pp. 127 and 121).

Liver, Gall Bladder and Ducts.

HEPATIC ABSCESS.—There were six cases (one medical); all were treated by operation, and four recovered. (See Appendix II.)

BILIARY FISTULA.—A woman, aged 57, who had undergone cholecystotomy in 1895 (see p. 172 of the report for that year) was readmitted and underwent a small operation for the closure of the fistula. Her general health had improved greatly and the jaundice had gone. The fistula was still open when she was last seen. (iii. 1109.)

Intestines.

HERNIA.—The number of patients (147) admitted for reducible hernia is slightly greater than that of either of the two preceding years (144 and 138). The cases of irreducible hernia (28) show a decrease in number (36 and 30) in previous years. The number of strangulated hernias (50) is greater than in any of the four preceding years (46, 45, 47, 41).

There were no deaths among the 175 cases of reducible and irreducible (non-strangulated) hernia.

Among the **UMBILICAL** hernias was one case of true congenital umbilical hernia. The patient was a female infant, aged 3 weeks; the hernia was four inches in diameter, and was partly reducible. The skin over it was sloughing; no operation was performed, and the child left the hospital in a few days. (v. 896.)

A man, aged 61, was admitted with the history that for several years he had had a right **INGUINAL** hernia, for which he had never worn a truss, and which had always been easily reducible until four days previously. Since that time

he had not been able to reduce it, and for about a week it had been rather painful. There had been neither vomiting nor constipation. The patient on admission did not look particularly ill. The hernial swelling was nearly as large as a coconut, hard, painless, slightly red and evidently containing much fluid. There was no impulse on coughing and the tumour was not translucent. The swelling extended right up to the inguinal canal, and was somewhat wider above than below; it was dull everywhere except at its upper part. The diagnosis between hernia and hydrocele was at first a little uncertain; on the day after admission, however, the swelling being smaller, and having a distinct impulse, there was no doubt as to its hernial nature. There was still no vomiting and the bowels had been opened once. Under chloroform, the hernia was reduced easily and with the usual gurgle. On recovering from the anaesthesia the patient complained of abdominal pain, then rapidly became collapsed, and died in three hours. The post-mortem showed that the whole of the CÆCUM had been badly strangulated and was gangrenous. The fluid in the hernial sac had consisted mainly of thin liquid faeces which had been returned together with the hernia into the peritoneal cavity, thus setting up fatal peritonitis. The absence of the usual symptoms of strangulation in this case was very remarkable. (ii. 1591.)

The case of DIAPHRAGMATIC hernia was also a remarkable one. A man, aged 60, was admitted profoundly collapsed and moribund, and died a few minutes afterwards. There was a history of at least four days' frequent vomiting and severe abdominal pain. The post-mortem showed a congenital diaphragmatic hernia, the pyloric half of the stomach having passed up into the left pleura through an opening two inches in diameter just to the left of the œsophageal opening in the diaphragm. There was no evidence of strangulation. The cardiac half of the stomach was enormously distended from chronic obstruction, and presented a simple ulcer at the lower part of the posterior wall. This had recently perforated and caused extravasation of the contents of the stomach into the lesser peritoneal cavity, thus causing the acute symptoms which led to the patient's death. (ii. 2906.)

FÆCAL FISTULA.—Four female patients were admitted in this condition; two underwent resection of the intestine, one of these recovering; in the two following cases no operation was performed.

A woman, aged 65, who had undergone an operation for hernia outside the hospital four weeks previously, was admitted very ill with a faecal fistula in the region of the wound. She gradually sank and died a fortnight later. The post-mortem showed marked interstitial nephritis and a good deal of peritonitis. (v. 2304.)

A woman, aged 70, was admitted with a faecal fistula in the right groin. The history was that thirty months previously she had been operated upon at another hospital for gangrenous femoral hernia, and the gut had been opened. Three months later, resection of the intestine had been performed and a Murphy's button put in. Within a month of this operation the fistula had closed, and it remained closed until six weeks before admission, when an abscess formed and the fistula re-opened. The button was passed per rectum exactly two years after its insertion. On admission there was a small fistulous opening in the groin, which did not cause much trouble. The patient refused any further operation and was discharged with an abdominal belt. (i. 2217.)

ENTERO-VESICAL FISTULA.—A woman, aged 36, was admitted with an entero-vesical fistula of two and a half years' duration; it had occurred after an attack of pelvic cellulitis. The symptoms were thought to be not sufficiently severe to justify any operation. (v. 1295.)

INTESTINAL OBSTRUCTION.—Nine patients were admitted for acute intestinal obstruction. Of these, eight underwent abdominal section, one recovering. One underwent no operation, as the patient died just as it was about to be performed.

This was a man, aged 58, admitted in a moribund condition with intestinal obstruction of three days' duration. There was no history of any previous illness. The attack had begun very suddenly with abdominal pain, followed by very frequent and violent vomiting and absolute constipation. On admission his face was of a dusky livid colour, and his breathing was rapid; his abdomen was greatly distended, so that nothing could be felt in it. He died an hour or two after admission, just as an exploratory abdominal section was about to be performed. The post-mortem showed a BILIARY CALCULUS, measuring 35 by 25 mm., impacted in the jejunum fourteen feet above the ileo-cæcal valve; it could easily be pushed upwards, but not downwards. It had ulcerated through the first part of the duodenum from the bile duct, where some other small calculi were also found. (iv. 1395, and Museum spec., No. 2030A.)

Besides the above-mentioned nine cases, there were three other cases (all males), in which symptoms of acute obstruction complicated other conditions; one is described under inguinal colotomy (v. 1067), another under abdominal section (ii. 3317), and the third under fractured pelvis (i. 3427*); these cases appear in Statistical Table I. under carcinoma of the colon, cyst of the pancreas, and fracture of the pelvis, respectively.

A case of simulating intestinal obstruction is described under abdominal section for enteritis. (v. 2583.)

INTUSSUSCEPTION.—Five cases were admitted; all were females. Three were treated by abdominal section; one of these recovered. The other two underwent no operation. One was a child, aged 7 months, who was admitted very ill on the fourth day of symptoms, and who died an hour after admission (v. 2561.) The other was a child, aged 10, who, five years previously, had been in the hospital with acute intussusception which had been reduced by abdominal section. She was readmitted with symptoms of chronic intussusception, which were relieved by the injection of milk. (v. 2293.)

ENTERITIS.—Four cases were admitted; two were trivial ones and soon recovered; one closely simulated mechanical obstruction, and is described under abdominal section (v. 2853.) The fourth was that of a baker, aged 27, who was admitted with a swelling in the left iliac fossa. He had been quite well until one year previously, when he began to have diarrhoea, and often passed blood per rectum. These symptoms had lasted almost continuously ever since, but were less marked when he was carefully dieted. On admission he was a pale, rather thin man; in the left iliac region was an elongated swelling, apparently a thickened and inflamed sigmoid flexure; some, however, thought that it might be a new growth. Under an anæsthetic nothing more was made out. The patient improved considerably under medical treatment, and left the hospital six weeks after admission. (v. 3588*.)

APPENDICITIS.—There was a slight decrease in the total number of cases (48) compared with that of the previous year (50). There were four cases in which the acute symptoms subsided without external suppuration; two of these were mild cases (Male, ii. 719, iii. 2966) and recovery soon ensued. Another was that of a girl, aged 14, who was admitted on the third day of a first attack, which had begun acutely with violent abdominal pain and vomiting. On admission the abdomen was distended, tense and tender. Leeches were applied; the abdominal swelling gradually subsided, and the patient got quite well without any operation. (i. 2009.)

The fourth was a very similar case, but an exploratory abdominal section was performed; no collection of pus was found and nothing was removed (see Appendix II., Female i. 1620); an excellent recovery followed.

There was also three other cases of possible appendicitis, which appear in the Statistics under the head of pelvic abscess (Female ii. 1852), rupture of rectus abdominis (Male v. 291), and abdominal pain (Male iii. 933) respectively;

all these cases recovered, and there was never any definite evidence of their being cases of appendicitis at all.

Seventeen were CHRONIC RELAPSING CASES without external suppuration. Of these, thirteen (Male i. 1364, 2216, 2262, iii. 1431A, iv. 1175, 1965, v. 890, 3244 ; Female i. 2335, ii. 408, 1772, iv. 1878, v. 1078) were treated by removal of the appendix in a quiet interval ; all recovered. The other four recovered without any operation ; a man, aged 20, after a third attack, refused operation (v. 1202) ; a boy, aged 10, who had already had the appendix removed, was readmitted with fresh pain in the iliac fossa and vomiting, but soon recovered (iv. 3179) ; the other two were very mild cases (Male i. 523, 2701). Another doubtful case (in the Statistics under carcinoma of cæcum) may perhaps have been a case of appendicitis (Male i. 1231). All recovered.

There were twenty-three ACUTE cases accompanied by suppuration ; of these, one underwent no operation and died soon after admission ; this was a boy, aged 7, with acute symptoms of four days' duration. The abdomen was tender and distended, and the case was thought at first to be one of tuberculous peritonitis ; the child was very ill on admission and rapidly sank, dying on following day. The post-mortem showed about half a pint of pus diffused all over the abdomen ; the appendix was perforated near its tip. (iii. 1478.)

The remaining twenty-two were all submitted to operation of one kind or another, and nine of them died.

Nine were treated by free incision into the general peritoneal cavity.

In two of these cases the appendix was removed and the abdomen washed out and drained ; one of these patients recovered (Male v. 3577*), one died (Male iii. 1628).

In five other cases the abdomen was similarly washed out and drained, but no search was made for the appendix ; all these cases died. (Male i. 674, iii. 761, 2113, v. 458 ; Female iv. 452.)

In one case there was no irrigation ; this patient died (Male v. 3545) ; the eighth case was treated by local sponging without irrigation, and recovered. (Male i. 2696.)

Thirteen cases (Male i. 2379, ii. 144, 2224, 3116, iv. 3553, v. 3039 ; Female i. 2642, ii. 259, 2895*, iv. 667, v. 169, 1426, 1558) were treated by limited incision through adhesions into the abscess cavity, no attempt being made to remove the appendix ; of these, only two died (Male ii. 144, 3116), but in both these cases it was found that the operation had not been limited to the abscess cavity, but that the general peritoneal cavity had also been opened ; in both these cases the abscess cavity had been washed out.

The details of these twenty-three cases, many of which were extremely ill at the time of operation, will be found in Appendix II. (p. 224).

There were four cases of CHRONIC appendicitis with abscess.

Two were treated by free incision, removal of the appendix and removal of the pus by local sponging without washing out (Female v. 2011 ; Male iv. 1719) ; one man was treated by limited incision through adhesions and recovered. (iv. 1762) ; the fourth case was a trivial one of a man who had a small sinus connected with an abscess of the appendix that had previously been opened by direct incision ; he refused any further treatment. (i. 3211.)

There was also one case of a girl (in Statistics under acute intestinal obstruction, *q.v.*) in which the obstruction was caused by old appendicitis. (iii. 120.)

DISEASES OF THE GENITO-URINARY ORGANS.

Bladder.

CALCULUS.—Eleven patients were admitted ; five were treated by lithotripsy, with one death ; five by supra-pubic lithotomy, with one death ; the eleventh patient was a man, aged 41, with symptoms pointing to calculus, but none could be found, and no operation was performed. (iv. 3725*.)

RENAL FISTULA.—A woman, aged 53, was admitted with a fistula in the loin. A stone had been removed from the kidney ten years previously ; quite recently the wound had reopened and discharged a little urine. No further operation was performed. (i. 804.)

OLD SUPRA-PUBIC CYSTOTOMY.—The cook, aged 31, from whose bladder a villous growth had been removed a year ago, and whose case is described on p. 185 of last year's report, was readmitted ; she had continued to have pain in the side ever since the operation. She was examined with the cystoscope and only a healthy scar was found. (iii. 856.)

The brickmaker, aged 47, who had undergone supra-pubic cystotomy for cystitis and enlarged prostate at the early part of the year, and whose case is described on page 205, was readmitted four months later with cystitis and a fistulous opening into the bladder ; the bladder was washed out and the fistula soon healed. (ii. 1368.)

Kidney.

OLD NEPHRECTOMY.—A woman, aged 25, who had undergone nephrectomy in 1892 for renal calculus, was readmitted ; the sinus resulting from the operation had never healed. She remained four months in the hospital and underwent two scraping operations ; the sinus then healed, but it broke open again soon after she left the hospital. (iii. 2512*.)

OLD NEPHRORRAPHY.—A schoolmistress, aged 35, who had undergone double nephrorraphy at another hospital a year previously for supposed moveable kidney, was readmitted with pain in the loin. No further operation was advised, but she was relieved by an abdominal belt. (v. 2918*.)

Prostate.

Seventeen patients were admitted for enlargement of the prostate ; fourteen underwent no operation other than catheterisation ; two underwent supra-pubic cystotomy and recovered from it ; one was treated by excision of part of each vas deferens and died. (See Appendix II.)

Urethra.

STRICTURE.—Of thirty patients admitted, three were treated by external and nine by internal urethrotomy, and the remainder by catheterisation ; the only death occurred among the latter ; the patient was a man, aged 63, admitted very ill with an urinary fistula and stricture of many years' duration ; he developed a large pelvic abscess, gradually became weaker, and finally died of exhaustion and suppuration on the thirty-second day after admission. There was no post-mortem. (i. 3699*.)

(See also other cases of stricture under the next heading.)

Urine and Urination.

EXTRAVASATION.—Four cases were admitted ; in three the condition was due to stricture ; all these died ; the fourth was a curious case of a boy, aged 3, admitted for paraphimosis and extravasation of urine ; he was treated by circumcision and incisions into the scrotum, and recovered (described in Appendix II. under circumcision).

The three who died were:—

A labourer, aged 53, admitted in a moribund condition with extravasation and cystitis due to stricture. A catheter could be passed. He died on the day after admission, and the post-mortem showed acute pyelo-nephritis. (i. 1887.)

A man, aged 57, admitted very ill with a stricture of long standing and extravasation of four days' duration. Incisions were made, but he died two days later. The post-mortem showed dilatation of the bulb and the usual appearances of extravasation. The kidneys were not dilated. (ii. 2395.)

A broker, aged 64, with a stricture of many years' duration, was admitted with extravasation of urine and gangrene of the scrotum. Incisions were at once made into the swollen area, but the patient gradually sank and died thirty-five days later. The post-mortem showed pelvic cellulitis, abscess of the prostate, cystitis and suppurative pyelo-nephritis. (v. 2781.)

Vulva and Vagina.

NOMA VULVÆ.—A female child, aged 15 months, was admitted very ill and died two days later. The disease had been in progress for three weeks. There was no post-mortem. (ii. 673.)

DISEASES OF THE ORGANS OF LOCOMOTION.

Bone.

CARIES.—Among thirty-nine patients admitted for caries of the spine, there were two deaths.

A boy, aged 11, who had been in the hospital many times before with tubercle in various parts of the body, including the spine, and who had formerly undergone amputation of the thigh for disease of the knee, was readmitted with tuberculous meningitis, and died three weeks later. (v. 3178.)

A girl, aged 3, was admitted very ill with extensive caries of the dorsal spine and tuberculous meningitis, and died a week later. (iv. 306.)

The post-mortem in both these cases showed wide-spread dissemination of tubercle.

NECROSIS.—There were four deaths among fifty-two patients; one was after sequestrotomy for necrosis of the FEMUR (see Appendix II.); the other cases were:

A boy, aged 5, who four days before admission fell and bruised his leg; there was no wound. Next day he seemed ill, but nothing very definite could be made out. On admission he was moribund, the thigh was greatly swollen, and death occurred in a few hours. The post-mortem showed necrosis of the whole shaft of the FEMUR, with suppuration among the muscles of the thigh and the usual signs of very acute septicæmia. (ii. 1480.)

A schoolboy, aged 12, was admitted very ill with acute necrosis of the TIBIA following a kick nine days previously. For three days he had complained of pain, and rigors had occurred. Injections of anti-streptococcus serum were given and an incision was made down to the bone, letting out some pus. The boy died two days after admission, and the post-mortem showed pericarditis and other signs of acute septic poisoning. (i. 746.)

Another schoolboy, aged 12, was admitted very ill with acute necrosis of the TIBIA of four days' duration. In spite of incisions down to the bone, he got rapidly worse, developed symptoms of septicæmia, and died on the fifth day after admission. The post-mortem showed numerous infarcts in the lungs and other signs of septicæmia. (iv. 2798.)

LEONTIASIS OSSEA.—A brushmaker, aged 19, was in the hospital twice during the year, on account of well-marked leontiasis ossea. For four years he had noticed increasing swelling of the bones of the face, on either side of the nose. For two years there had been some noticeable obstruction of the nostrils. On admission both superior maxillæ were found to be symmetrically much enlarged and smooth. The skin on either side of the bridge of the nose was raised to the level of the latter. The bony growth extended also upwards into the orbit, and downwards to the hard palate, and the nostrils were almost completely occluded. No treatment was advised. (ii. 3808* and 1280.)

HYPERTROPHIC PULMONARY OSTEO-ARTHROPATHY.—The case of the girl, aged 10, fully described in last year's report, page 121, was again in the hospital for a few weeks; her condition was practically unaltered. (v. 24.)

Joints.

TUBERCULOUS DISEASE.—Of seventeen patients admitted for tuberculous disease of the ELBOW, four underwent excision, one erosion, and one amputation; the rest were treated without operation.

Of fifty-one patients admitted for tuberculous disease of the HIP, two only were submitted to excision; one of these died. (See Appendix II.)

There were two other fatal cases.

A woman, aged 28, who had suffered from hip disease in early childhood, and upon whom infratrochanteric osteotomy for ankylosis had been performed eight years before admission, was admitted with a large residual abscess. This was opened, and on several subsequent occasions counter openings were made. Suppuration, however, continued, severe hæmorrhage occurred on two occasions, and the patient died of exhaustion five months after admission. The post-mortem showed pulmonary phthisis and perforation of the acetabulum. (ii. 787.)

A girl, aged 19, had had pain in the right groin following "typhoid fever" twenty months before admission; eight months later an abscess, supposed to be connected with the appendix, had been opened at another hospital. A sinus had existed ever since. On admission the patient was very thin and ill; there was a sinus just above Poupart's ligament. This was opened up and scraped, and found to pass down behind the femoral vessels to the inner side of the thigh where a counter opening was made. It was believed that there was disease of the hip. A fortnight after the operation there was a discharge of feces through the wound. Six weeks later symptoms of meningitis set in and thirteen days after this the patient died. There was no post-mortem, so the exact nature of the case was never very clearly ascertained. (iii. 1093.)

Of forty-seven patients with tuberculous disease of the KNEE, three were treated by amputation, six by excision, four by erosion, one by trephining the head of the tibia, and thirty-three without operation; the only death was one after erosion (*q.v.*).

Of three cases of tuberculous disease of the SHOULDER, one was treated by excision.

Of fifteen cases of tuberculous disease of the TARSUS, three were treated by amputation, seven by erosion, and five without operation. There was one death, after erosion (*q.v.*).

Of five cases of tuberculous disease of the WRIST, one was treated by erosion.

SUPPURATIVE ARTHRITIS.—A male infant, aged 7 months, was admitted very ill with acute suppuration of eight days' duration in the KNEE, ELBOW and ANKLE. All three joints were opened and the pus washed out with a 1 in 1,000 biniodide of mercury lotion. The child got quite well and left the hospital eleven days after admission. (v. 2313B.)

DISEASES OF BURSÆ, FASCIÆ AND TENDONS.

The only death was after a removal of a compound palmar ganglion. (See Appendix II.)

DISEASES OF THE CELLULAR TISSUE.

There were no deaths.

The only cases that seem worthy of special notice were the following :—

A boy, aged 14, was admitted with a large rounded tender swelling in the buttock; it had been noticed for ten days. It was punctured three times, first with an exploring needle and then twice with a large aspirator, but nothing came away but a little blood. The tumour was then believed to be sarcomatous, but some doubt being still felt as to its nature, an incision was made through the gluteus maximus and a cavity opened which contained several ounces of pus mixed with old blood clot and shreds of muscle. It was clearly a suppurating hæmatoma, and it was evident that the loose shreds of muscle must have blocked the cannula used in the aspiration. The boy made a speedy recovery. (ii. 1859.)

A girl, aged 5, was admitted with an iliac abscess, which was opened by the house surgeon by an incision above Poupart's ligament. A counter opening was also made in the loin, and a drainage tube was about to be inserted when the patient coughed and a coil of small intestine appeared in the wound; the peritoneum had been accidentally opened. The intestine was replaced, the peritoneal wound closed, and the patient made an uninterrupted recovery. (ii. 2848*.)

DISEASES OF THE CUTANEOUS SYSTEM.

There was one death, from PURPURA HÆMORRHAGICA.

A boy, aged 3, was admitted for epistaxis and purpuric spots all over the body. The spots had been first noticed seven days previously, and epistaxis had begun two days later. On admission the child was much blanched. The spots gradually faded, but the epistaxis recurred, dyspnoea set in, and the child died on the thirteenth day after admission; there was no post-mortem. (iv. 1040.)

BURNS AND SCALDS.

Thirty patients were admitted for BURNS; of these, six died.

In the case of eight female and seven male patients (chiefly young children), the burn was produced by the clothes catching fire; of these, four boys and two girls died; four of these died within twenty-four hours, the other two living two and six days respectively.

In the case of two adult women, one man and one boy (who sat down on some carbolic acid), the burns were caused by chemicals and were not severe; all recovered.

Two female children, one woman and one man had fallen into the fire (the last two were epileptics); all recovered.

Two youths were burnt by gas explosions (one of these was looking for a gas leak with a lighted candle!); a man was burnt by flame from a furnace; all these recovered.

In the cases of three male and one female patients, the causes were miscellaneous or not stated; none of these died.

Of thirteen male and seventeen female patients admitted for SCALDS, three died; a male infant, aged 20 months, fell into a bath and died in a few hours. (v. 3536.) ; a female infant, aged 2, fell into a bucket of boiling water and died in nine hours (iii. 1394); a female infant, aged $2\frac{1}{2}$ years, upset some boiling water and died next day (v. 951); of the remaining thirty, twelve were scalded by upsetting tea or other hot drink, eight by upsetting hot water, one by spilling fat from a frying pan, four by falling into hot water, one by drinking from the spout of a kettle, while in four the cause was unknown or not stated.

INJURIES OF THE HEAD.

Wounds.

GUNSHOT.—Five patients were admitted; all recovered.

A boy, aged 16, with a bullet wound of the face; no attempt was made to extract the bullet. (iii. 739.)

A waiter, aged 17, was admitted with a suicidal bullet wound of the auditory meatus. The membrane was destroyed and the facial nerve completely paralysed. The bullet was neither seen nor felt, and no attempt was made to extract it. The patient made a good recovery, having never had any serious symptoms other than the facial paralysis, which was still present when he left the hospital sixteen days after admission. (v. 2652.)

A lunatic, aged 18, fired a bullet into the middle of his hard palate; there was no evidence as to the exact situation of the bullet, and no attempt was made to extract it; the patient made a good recovery. (ii. 2907.)

A man, aged 37, shot himself through the palate with a revolver; the left eye soon became prominent, then blind and inflamed; on the eleventh day the eyeball was removed; the patient developed some optic neuritis in the right eye, but otherwise made a good recovery; no attempt was made to extract the bullet. (iii. 2424.)

An engineer, aged 37, was admitted with a recent suicidal revolver wound of the soft palate. Two years previously he had been operated upon at another hospital for varicocele, and the testis had to be removed shortly afterwards. On admission he had lost much blood, but was quite conscious. On the right side, at the junction of the hard and soft palate, was a ragged bullet wound; there were no other localising symptoms. On the following day search for the bullet was made through the wound and also through an incision in the neck behind the angle of the jaw; no bullet was found; the external wound healed quickly. Eight days after admission, examination of the larynx showed complete paralysis of the right vocal cord and anaesthesia of the right side of the larynx. The patient made a good recovery, but the paralysis of the larynx remained. The temperature, never above 100° , was normal after the first week. (v. 1674.)

Foreign body in Cheek.

A man, aged 25, came to the hospital with a small sinus in the middle of one cheek; he said he had received a blow in that region a few days previously, but had not paid much attention to it; a probe passed into the sinus struck something hard, which was thought at first to be bare bone; an incision led to the extraction of about an inch of clay tobacco pipe, which was imbedded in the soft tissues of the cheek; there was no clear history of how it got there. (i. 1899.)

Traumatic Hemiplegia.

A girl, aged 7, fell from a cart, but was apparently not hurt, as she continued to play as usual; there was no unconsciousness and no sign of injury to the head. On the following day she vomited, then had a convulsion and became unconscious, remaining so for the next three days. On the fourteenth day after the accident she came to the hospital and was admitted. She was then almost completely aphasic, and had complete paralysis of the right arm and leg with some rigidity. She steadily improved, and left the hospital on the eighty-fifth day after admission. She could then talk fairly well; the rigidity and paralysis were much less. The mental condition was not bright. (i. 1469.)

Concussion of the Brain.

Fifty-six patients were admitted for simple concussion; all recovered.

Fractures.

BASE OF SKULL.—Of twenty-nine patients admitted, only one was a female.

Fourteen died.

A man, aged 50, fell twenty feet on to some concrete; he never regained consciousness and died in eighteen hours; he had also fractures of ribs, radius, ulna, tibia and fibula. (i. 2366.)

A man, aged 41, was found unconscious in a yard; he was supposed to have fallen from a wall. He never regained consciousness; the temperature rose rapidly to 104°, and he died a few hours after admission. The post-mortem showed fracture of the base of the skull and laceration of the frontal and occipital lobes. (i. 2374.)

A grocer, aged 42, fell and struck the back of his head against the kerbstone. He never regained consciousness, and died on the third day. The temperature before death was 106°. At the post-mortem, a fracture was found running from the occipital protuberance forwards across the petrous bone to the middle lacerated foramen. The brain was much lacerated. (i. 1063.)

A boy, aged 16, fell forty feet on to his head and died a few hours later. The anterior fossa of the skull was extensively fractured and the brain lacerated. There were also fractures of the ribs and laceration of the lung. (ii. 522.)

A man, aged 38, while drunk, had fallen out of a cab on to his head. On admission he had two small scalp wounds on the back of his head. No fracture of base or vault could be detected. The patient was at first somewhat drowsy, but on the third day restlessness and delirium set in, his temperature began to rise, and he died two days later. The post-mortem showed septic basal meningitis and a linear fracture of the posterior fossa. (iii. 3477.)

A man, aged 40, was knocked down by a van, admitted unconscious, and died in four hours. The post-mortem showed an extensive fracture of the middle fossa of the skull and a large extradural hæmorrhage compressing chiefly the frontal lobe; the brain was not lacerated. (iii. 2960.)

A mailcart driver, aged 57, was said to have fallen down some stone steps ; he was admitted unconscious and bleeding from one ear ; he never regained consciousness, and died on the eighth day. The post-mortem showed an extensive fracture of the middle and posterior fossa and much laceration of the brain. (iii. 2304.)

An ostler, aged 21, was thrown out of a dogcart on to his head and brought to the hospital insensible. He gradually developed symptoms of meningitis and died on the eleventh day. At the post-mortem, an extensive fracture of the anterior and middle fossa was found crossing the sphenoidal and ethmoidal sinuses, whence the infection had started. There was some superficial laceration of the brain and extensive suppurative meningitis. (iv. 223.)

A man, aged 50, who had been a heavy drinker, was admitted in a very violent condition and supposed to be suffering from delirium tremens. A few hours previously he had fallen down some steps and struck the back of his head. There was no facial paralysis, no bleeding from the ear, nor any other definite sign of fractured base. For the first ten days he was very irritable and restless ; he then became more and more drowsy, and finally died on the sixteenth day after admission. The post-mortem showed a fissured fracture of the right posterior fossa and much laceration of the left temporo-sphenoidal and frontal lobes. (iv. 2474.)

A labourer, aged 51, had been struck on the forehead by a piece of grindstone. There was a lacerated wound exposing a fissured fracture of the frontal bone. He quickly became very restless, and his temperature rose to 103°. He died on the second day after the accident. The post-mortem showed an extensive fracture of the anterior part of the base of the skull extending into the orbital and nasal cavities. The brain was much lacerated, the ventricles even having been opened. (iv. 598.)

A cabinet maker, aged 82, was knocked down by an omnibus and died on the tenth day ; the post-mortem showed an extensive fracture of the orbit, temporal region and base of the skull. (v. 2833.)

The three other fatal cases are described under trephining (Male ii. 2394, and iii. 753), and tracheotomy (Male iii. 562).

Among the fifteen cases that recovered, were the following :—

A labourer, aged 47, fell seven feet on to his head, was slightly concussed, had hæmorrhage from one ear, and became completely deaf. Next day facial paralysis set in on the same side. The patient made a good recovery, and the facial nerve to a certain extent recovered its function. The deafness remained. (iv. 3359.)

A paper maker, aged 41, fell down a flight of stone steps and was concussed for about an hour. There was profuse bleeding from one ear for two or three days. On the day after admission he became very drowsy and his temperature rose to 102° ; then headache and aphasia occurred together with optic neuritis in one eye. The symptoms gradually subsided, and the patient left the hospital on the eighteenth day after the accident, apparently nearly well. (ii. 3812*.)

VAULT OF SKULL.—Of eight patients admitted with SIMPLE FRACTURES, four died.

A man, aged 75, was knocked down ; he never regained consciousness, and died on the second day. The post-mortem showed an extensive transverse fracture of the vault ; there was no depression of the bone, but much laceration of the brain and much intradural hæmorrhage. (ii. 1744.)

A shop assistant, aged 18, was thrown on to his head, and was admitted unconscious with a small wound above and behind the left ear. Gradually he

developed retraction of the head, restlessness and other signs of meningitis, and died on the sixth day. The post-mortem showed an extensive fracture of the vault and base and much hæmorrhage both inside and outside the dura mater. The hæmorrhage was almost entirely on the right side; there was also much laceration of the brain and recent meningitis limited also to the right side. (ii. 142.)

A professional swimmer, aged 24, dived into shallow water and, turning over in the descent, struck the back of his head against the tiles at the bottom. He complained only of feeling a little sick, and was able to walk home and have some tea. About two hours after the accident, he had a general convulsion, and half-an-hour later became unconscious. Five hours after the accident he was brought to the hospital; he was then completely comatose with alternating twitching with rigidity and flaccidity of his limbs. The left pupil was pinpoint, the right dilated. Three hours later he suddenly improved, and a small hæmatoma appeared just above the right ear. There was then slight left facial paralysis. The knee jerks, at first absent, were now exaggerated. When seen shortly afterwards by the surgeon, it was decided that no operation would benefit him as his condition was very bad and the localising signs were not sufficiently pronounced. The patient never regained consciousness, and died fifteen hours after the accident. The post-mortem showed a fissured fracture of the right parietal bone just behind the coronal suture. There was a large extradural hæmorrhage some four inches in diameter beneath the fracture, and also some small hæmorrhages in the pons and about the upper part of the spinal cord. (v. 2157.)

The fourth case is described under trephining. (Female iii. 1624.)

Four patients recovered.

One is described under trephining. (Male iii. 1778.)

Two were cases of simple fissured fracture that recovered without trephining, and the fourth was a female infant, aged 20 months, who fell from her father's arms on to the pavement. There was a simple depressed fracture of the frontal bone. There were no symptoms, no operation was performed, and the child made an excellent and rapid recovery. (iii. 761.)

COMPOUND FRACTURE OF SKULL WITHOUT DEPRESSION.—Of nine patients admitted, eight underwent no operation and all recovered. (Male ii. 3813*, 310, iii. 3192, 3339, iv. 2138, 3200; Female i. 533, iv. 2084.)

The ninth case was trephined, and died. (ii. 1435.)

COMPOUND FRACTURE WITH DEPRESSION.—Nine patients were admitted.

Six underwent trephining or elevation of bone; of these, one died.

Three recovered without operation.

A boy, aged 14, with a compound depressed fracture over the frontal sinus, never had a bad symptom. (i. 3418.)

A boy, aged 15, upon whose head a hammer had fallen from a height of thirty feet; he walked to the hospital and made an excellent recovery; the frontal bone was very slightly depressed at the seat of injury. (iii. 2948.)

A boy, aged 15, who had been knocked down by the tailboard of a van, had slight depression, apparently of the outer table only; he never had a bad symptom. (iv. 2121.)

Meningeal hæmorrhage.

Two were comparatively slight cases, and recovered without operation. (Male v. 446; Female v. 1659.)

A man was trephined, and died. (i. 1219.)

A woman, aged 71, fell and struck her head and was unconscious for a few moments. She then became drowsy and ill. When admitted she was just able to walk; there was no paralysis and no definite sign of injury. Coma gradually supervened, and she died three days after admission. The post-mortem showed a thin layer of blood in the subdural space over the whole of the right cerebral hemisphere. The hæmorrhage had apparently come from some large meningeal veins. (ii. 1271.)

INJURIES OF THE ABDOMEN.

Rupture of liver.

There was one case, which appears in the Statistics under fracture of the spine, which was the chief cause of death. (i. 878.)

Rupture of kidney.

A carman, aged 35, was admitted in a dazed and collapsed condition; he had been thrown on to the edge of a box, striking his loin. For the first twenty-four hours he had very profuse hæmaturia; then restlessness and delirium set in (the latter supposed to be delirium tremens as the patient drank much). On the ninth day after admission, an incision was made down to the left kidney from the loin, and half a pint of urinous pus was let out; no lesion of kidney or ureter was actually seen. The patient made a slow recovery. The delirium lasted altogether about six weeks. The patient eventually left the hospital on the seventy-sixth day after admission; the lumbar wound was then almost closed. The hæmaturia had ceased on the second day after admission. (iii. 1916.)

He was readmitted three months later. (See Nephrotomy, iii. 2975.)

Rupture of spleen.

A mail cart driver, aged 55, was thrown from his cart, a wheel then passing over his chest. Numerous ribs were broken and there was much collapse and severe dyspnœa; the latter rapidly increased until the third day, when the patient died. At the post-mortem, the spleen was found to be much lacerated at the upper and back part. The second and the tenth ribs on the left side were broken, and there was much blood in the abdomen and left pleura. (iv. 13.)

Rupture of intestines.

A general dealer, aged 68, was run over by a van; he walked to the hospital. On admission he was not much collapsed; the lower part of the abdomen was tender, but not distended; there was an old irreducible inguinal hernia. In the first twelve hours he was sick occasionally, then the abdomen became distended, and more tender and complete constipation set in. The diagnosis made was injury to the intestine; after a consultation, it was thought best to explore the hernia, as there seemed just a possibility that this might be in some way connected with the symptoms. An incision was therefore made into the sac and a quantity of fæcal matter came out, evidently from the general peritoneal cavity. The abdomen was drained. The patient died an hour later. The post-mortem showed a rent half an inch long in the small intestine, six inches above the ileo-cæcal valve. (iii. 542.)

A boy, aged 4, was run over by an empty brewer's dray, the wheel passing over the lower part of the abdomen. He was brought at once to the hospital; he was then much collapsed, and complained of pain about the region of the pelvis. The abdomen was not distended and moved well with respiration; it was somewhat tender. Restlessness quickly set in, the temperature rose rapidly; a few hours later the abdomen began to swell, delirium set in, and the boy died thirteen hours after admission. The post-mortem showed an

extensive fracture of the ilium. The ileum at a point ten inches above the ileo-cæcal valve presented on its posterior surface a transverse rent involving one-third of the circumference. There was some local extravasation of intestinal contents; the intestines were empty; the injured portion lay just in front of the fifth lumbar vertebra, and had evidently been nipped between this and the wheel. (iii. 2961.)

INJURIES OF THE THORAX.

Wounds.

PUNCTURED, OF PERICARDIUM.—A boy, aged 14, while playing, was struck with a pocket knife over the apex of the heart. He was admitted greatly collapsed, but quickly recovered, and left the hospital three weeks later quite well. There were no abnormal physical signs, no dulness, no displacement of heart's apex. (iv. 2316.)

PUNCTURED, OF PLEURA AND? HEART.—A man, aged 20, was admitted with a recent wound caused by a stab from a knife. The wound had been plugged by a doctor immediately after the infliction of the injury. The patient on admission was much collapsed, his face was dusky and his lips blue; he had considerable dyspnoea. Just inside the left nipple was a wound an inch and a half long. When the plugging was removed for a moment, air rushed into the chest. The wound was sutured and the patient made a rapid recovery. Four days after admission there were signs of blood in the left pleura, but this was soon absorbed. (iii. 1809A.)

Fracture of ribs.

WITH INJURY TO LUNG.—Seven cases were admitted; five of these made good recoveries.

Two died.

A man, aged 56, who had been knocked down by a cart, was admitted with severe injuries to the lungs and fracture of numerous ribs; he died three days after admission; the post-mortem showed nothing more. (ii. 1596.)

A painter, aged 62, was crushed by a waggon. He was admitted with fracture of the second and third ribs on both sides and much surgical emphysema. He did fairly well for twelve days, then became suddenly collapsed and died. The post-mortem showed œdema of both lungs; one of them was much collapsed, and there was considerable effusion into the corresponding pleura. (ii. 2254.)

There was also three other cases, all fatal, in which injuries to the ribs and lungs co-existed with other injuries. These are classified under Compound fracture of skull, Fractured base, and Rupture of spleen. (Male i. 3575, ii. 522, iv. 13.)

WITHOUT INJURY TO LUNG.—Sixteen cases were admitted; two of these were complicated with dislocation of the sternal end of the clavicle. (Male ii. 1110, and v. 642) and two with fracture of the clavicle (Male i. 311, ii. 3802*.)

Fifteen recovered.

One died; he was a man, aged 77, knocked down by a van; he had also dislocation upwards of the sternal end of the clavicle; he died in two days, and the post-mortem showed also old disease of the kidneys. (ii. 1110.)

There were also three other cases, classified under Fracture of base, Compound fracture of skull, and Fracture of scapula. The first of these was fatal. (Male i. 2366.)

Fracture of sternum.

There were two cases, both fatal, in which this injury co-existed with other extensive injuries; they are classified and described under Fracture of spine. (Male ii. 1074) and Fracture of pelvis (Male ii. 1771).

INJURIES OF THE NECK.

Contusions.

A printer, aged 28, was knocked down; he fell on his back, and the wheel of a fully-loaded omnibus passed obliquely across the front of his neck; he was severely bruised, but made a rapid and complete recovery. The evidence of the bystanders as well as the marks on the neck corroborated the history given. (v. 272.)

Fracture of larynx.

A man, aged 49, received a blow on the throat; this was quickly followed by dysphonia, dysphagia, and slight dyspnoea; the thyroid cartilage was felt to be less resistant than normal. The patient made a rapid recovery. (iii. 3149.)

The other case is described under tracheotomy. (iii. 1472.)

Wounds.

GUNSHOT.—The only case was that of a boy, aged 17, who was shot with a revolver just above the left clavicle. He had no bad symptoms of any kind and soon left the hospital. Three weeks later he was readmitted, and the bullet, which could be felt just beneath the skin, was removed. (ii. 3114 and 3368.)

INCISED AND PUNCTURED.—Seven cases were admitted. Two of these were accidental; the others were cases of suicidal cut throat.

Only one died. A man, aged 46, who had been ill for many years with disease of the heart and kidneys, attempted suicide by cutting his throat. The thyroid cartilage was notched, but the air passages and great vessels escaped. The wound was immediately sewn up, and the temperature remained normal. He died, however, on the sixth day, chiefly from the condition of his heart. The post-mortem showed also chronic pleurisy and nephritis. (iv. 3501.)

Another case of suicidal cut throat accompanying fracture of the PELVIS, and other injuries, is classified and described under the latter heading. (iv. 1801.)

INJURIES OF THE BACK.

Intraspinal hæmorrhage.

A man, aged 39, was admitted with paralysis of one arm and signs of pachy meningitis, following a fall upon the head and shoulders three months previously. He improved considerably with rest and electrical treatment during his stay of four months in the hospital. (iv. 3480*.)

Fracture dislocation of spine.

A labourer, aged 48, recovered after three months' stay in the hospital. (iv. 3717*.)

A carman, aged 27, was carrying a case down a steep slope when he slipped and fell backwards. On admission shortly afterwards there was complete paralysis of the lower limbs, but no anaesthesia. The arms were flexed and paralysed in the upper parts. There was complete anaesthesia in the arms and hands. There was also priapism and absence of knee jerks; no ankle clonus. He was treated by rest and a gutta-percha splint to the neck. On the following day the anaesthesia had disappeared, and power of movement in the arms had begun to return. From this time he made a slow but good recovery. All paralysis disappeared, and he left the hospital five months after admission, able to walk without support. There was considerable cystitis during the recovery. (v. 3770*.)

Three patients died.

A man, aged 70, fell down stairs, and was admitted completely paralysed in all his limbs. He died five days later. There was no post-mortem. (iv. 2466.)

A labourer, aged 43, while drunk, fell off a chair and struck the back of his neck. When admitted there was complete paralysis of the lower limbs and some loss of sensation; knee jerks, at first absent, afterwards returned. The right pupil was larger than the left. There was a tender spot at the level of the seventh cervical vertebra, but no definite deformity. The question of trephining the spine was discussed and negatived. Much pain occurred in the arms and legs; several epileptiform convulsions occurred. Eleven days after admission he was placed under chloroform, and an attempt was made to reduce by traction the supposed dislocation; a gap could be distinctly felt between the vertebrae at the seat of injury. Reduction was not very satisfactory. The patient gradually became worse, and died of cystitis and pyelonephritis on the twenty-second day after the accident. The post-mortem showed an unreduced dislocation forwards of the left lower articular facet of the seventh cervical vertebra. The kidneys were suppurating, the cord was not crushed. (ii. 899.)

The fifth case is described under laminectomy. (ii. 2009.)

DORSAL.—All three cases died. None were trephined.

A man, aged 34, fell forty feet down a lift shaft; he died in a few hours; he had also a rupture of the LIVER. (i. 878.)

A man, aged 34, threw himself from a window, and died on the fifth day of oedema of the lungs. (v. 1684.)

A gasfitter, aged 58, fell about eight feet from a ladder; he was admitted completely paraplegic, and died on the fifth day; he had also fractures of the STERNUM and RIBS. The post-mortem showed a comminuted fracture of the sixth dorsal vertebra and a complete crush of the cord. (ii. 1074.)

INJURIES OF THE PELVIS AND GENITALS.

Fracture of pelvis.

Thirteen patients were admitted, besides four cases in which a fractured pelvis complicated other injuries, and which are classified under Rupture of INTESTINES (Male, iii. 2961), Fracture of SPINE (Male, v. 1684), Fracture of RIBS (Male, ii. 3288), and Dislocation of HUMERUS (Male, v. 1221A).

Six men and two women recovered; in four of these cases the fracture appeared to involve only the ILIUM (Male, i. 1262, ii. 173; Female, i. 993, v. 952); in one case the existence of a fracture was suspected only (Male, v. 3752*); in the case of a man, aged 56, there was also a fracture of the OLECRANON (v. 3056).

A man, aged 60, with a compound fracture of the arch of the pubes, developed CELLULITIS of the lower limb, but recovered. (iii. 1307.)

A labourer, aged 34, fell sixty feet on to a stone pavement, fracturing his pelvis. On the third day after admission the abdomen became greatly distended, the liver dulness had disappeared, and the patient was vomiting incessantly. At a consultation, the propriety of opening the abdomen was discussed, but negatived, chiefly on the ground that the man was too ill to stand any such operation. He made a gradual but steady recovery, and eventually left the hospital on the ninety-fourth day, quite well. (i. 3427.)

Four patients died.

A woman, aged 75, fell from a window, and died one hour after admission ; she had also fracture of the neck of the FEMUR. (v. 1319.)

A printer, aged 31, tried to commit suicide by cutting his throat ; he then threw himself from a window, and was admitted with a fracture of the PELVIS, base of SKULL, and other injuries. He died two days later. (iv. 1801.)

A man, aged 48, fell twenty feet from a scaffold, and died a few hours later. Besides an extensive fracture of the PELVIS, he had fractures of the STERNUM, OS CALCIS and ANKLE. (ii. 1771.)

A man, aged 49, was jammed between a van and a wall ; he died in six hours. At the post-mortem, the sacrum was found completely separated from the ossa innominata, and driven forwards ; the sacral plexus was torn, and there was much retroperitoneal hæmorrhage. (v. 816.)

A carpenter, aged 60, was caught between a post and an omnibus, and died two days later ; the post-mortem showed an extensive fracture of the pelvis. (iii. 1772.)

Old fracture of pelvis.

Described under external urethrotomy. (i. 2142.)

Rupture of urethra.

Of three cases, two were treated by catheter (i. 3090, ii. 3457), and one by external urethrotomy. (iii. 3176.)

All recovered.

INJURIES OF THE UPPER EXTREMITY.

Injuries of nerves.

RUPTURE OF BRACHIAL PLEXUS.—There were two cases, a woman, aged 47, and a girl, aged 12 ; the injury had been produced by a fall upon the shoulder into an area, and by a heavy piece of timber falling upon the shoulder respectively. In both cases the arm was completely paralysed, and there was some loss of sensation. The pupil on the corresponding side was contracted in each case. Electrical treatment did little good in either case. (v. 198 and iii. 1299.)

Fractures.

A man, aged 26, with a compound fracture of the humerus and rupture of the brachial artery, produced by the passage of a wheel over the arm, made an excellent recovery without amputation. (ii. 1454.)

INJURIES OF THE LOWER EXTREMITY.

Wounds.

LACERATED.—A man, aged 26, was admitted with a dirty lacerated wound of the knee, caused by a gas explosion. The wound was cleaned as far as possible, but suppuration took place, and on the sixth day the joint had to be freely opened and irrigated. The patient gradually sank and died on the sixteenth day after admission. There was no post-mortem. (ii. 341.)

Fractures.—SIMPLE.

FEMUR.—Fifty-nine cases of fracture of the shaft of the femur were admitted besides a case in which a spontaneous fracture occurred in the hospital (Male, i. 1466, described under sarcoma of the femur).

Two patients died.

One was a man, aged 58, described under wiring of femur. (v. 3224*.)

The other was a woman, aged 90, who fell out of bed; she was admitted with a simple fracture, which soon became compound. She was very old and feeble and gradually sank, dying on the ninth day. (v. 2423A.)

Among the fifty-seven cases that recovered were:—

A boy, aged 9, was treated by osteotomy (*q.v.*) two months after admission, the fracture having united badly. (v. 2008.)

A carpenter, aged 56, was admitted with a spontaneous fracture of the shaft of the right femur. For twelve months he had been ailing, had lost flesh, and had complained of pain in the right thigh. For three months he had been somewhat lame and had been treated for sciatica. Two months before admission his thigh suddenly gave way, and he had been in bed ever since. About the same time a swelling was noticed at the seat of fracture, and six weeks later enlargement of the cervical glands was first noticed. For two months he had had slight difficulty in micturating, but he had never had hæmaturia. On admission the patient looked ill; the fracture was about four inches below the great trochanter, and in this region was a rounded mass as large as an orange, apparently new growth. The cervical glands were very hard, and evidently infiltrated with carcinomatous growth. The prostate was large, hard and nodular. The case was looked upon as one of primary carcinoma of the prostate with secondary deposits in the femur and cervical glands. The patient left the hospital three weeks after admission, his condition not having materially altered. (v. 2617.)

PATELLA.—Twenty-three men and eleven women were admitted for recent fracture (including one woman classified under OLD fracture, which she also had, and for which an operation was performed (ii. 732). Of these, eleven men and three women were treated by primary wiring (*q.v.*).

In the case of one man (iv. 2312), the injury was complicated by other recent fractures (jaw and skull).

One patient died. He was a solicitor, aged 55, admitted with an ordinary transverse fracture, which was treated in the usual manner by splint, &c. He did perfectly well until the thirteenth day, when he suddenly complained of faintness and dyspnoea, and in a few minutes he was dead. At the post-mortem, general dilatation of the heart was found to have been the cause of death. (ii. 129.)

A mason, aged 67, fell thirty feet on to his hands and knees and sustained a stellate fracture of the patella. He developed delirium tremens and was subsequently transferred to an infirmary. (iv. 2622.)

A gasfitter, aged 31, was admitted for stiffness of the knee following an operation for wiring (described in Appendix II., p. 184, iv. 227), performed seven months previously. The original wound had healed perfectly, but the knee had remained very stiff. During manipulation of the knee under gas, to break down adhesions, the patella again broke, at the seat of the original fracture. He was treated by splint and rest, and the fracture united well, but the knee remained very stiff. (iv. 2364.)

COMPOUND.

FEMUR.—A traveller, aged 40, who had been crushed between a train and a platform, died in six hours. There was no post-mortem. (iv. 14.)

TIBIA AND FIBULA.—Of twenty patients admitted, two died. One underwent amputation. (Female, v. 1866.)

The other was an engineer, aged 36, whose leg had been shattered by a dynamite explosion. Although no other injuries were found, he died of shock in about four hours; no operation was deemed possible. (i. 1258.)

OLD.

PATELLA.—Thirteen patients were admitted for old fracture of the patella, besides five admitted for other conditions (Male, iii. 575, 1473, v. 1706; Female, iii. 1041, iv. 2401); none of these five underwent any operation.

Of the thirteen, three were treated by secondary wiring (*q.v.*).

Six were admitted on account of pain and stiffness after primary wiring at this or some other hospital (Male, i. 3277, iv. 2370, 3236, 3375; Female, ii. 1968, 2406); in one of these cases (iv. 3375) the wire had to be removed on account of pain.



TABLE II.
SURGICAL OPERATIONS PERFORMED.

OPERATIONS.	AGE AND SEX.																								
	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
OPERATIONS ON THE EYE.																									
Abcission
Canaliculus Slit
Cataract Extraction
Cauterisation of Ulcer
Saemisch's Operation
Dissection
Excision of Lacrymal Gland
Exstirpation of Globe
Iridectomy
Needling
Paracentesis of Anterior Chamber
Peritomy
Removal of Dermoid
Removal of Pterygium
Scleral Puncture
For Squint—
Tenotomy
Advancement of Rectus
Operation for Trichiasis

TABLE II. (continued).

[illegible]

TABLE II. (continued).

OPERATIONS.	AGE AND SEX.																							
	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-70.		Over 70.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
OPERATIONS ON BONES (continued).																								
Sequestrotomy (continued)—																								
Tibia...	4	2	4	2	..	..	1	...	1	...	1	...	1	2	...	1	...	...	...	...	...	...
" "	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Scapula	1	1	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Ulna ... ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trephining—																								
Jaw (Lower)	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mastoid (for Suppurative Otitis)	2	1	1	1	1	1	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..
Skull—																								
(For Cerebral Abscess)	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
(" Cerebral Tumour)	3	1	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(" Fracture)	7	1	4	..	3	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
(" Jacksonian Epilepsy)	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(" Meningeal Hemorrhage) ...	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tibia—																								
(For Osteitis)	1	1	1	1	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..
Elevation of Compound Depressed Fracture	3	..	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pinning Fractured Bones—																								
Femur	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wiring Fractured Bones—																								
Femur	2	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Olecranon	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Patella (primary) ...	11	3	11	3	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
" (secondary)	1	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tibia...	2	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..

TABLE II. (*continued*).

OPERATIONS.		AGE AND SEX.															
		TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON BONES (<i>continued</i>).																	
Laminectomy—																	
(For Fracture) ...	1	...		...		1	...	...	...	...	...	...	...	...	...	...	...
Transplantation of Tubercle																	
of Tibia ...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...
OPERATIONS ON JOINTS.																	
Removal of Loose Bodies—																	
<i>Knee</i> ...	4	1	...	4	1	...	...	...	...	...	...	...	...	...	...	...	...
Removal of Semilunar																	
Cartilage ...	2	...		2	...	...	...	...	...	...	...	...	...	...	...	...	...
Erasion of Tuberculous Joints																	
<i>Elbow</i> ...	1	...		1	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Knee</i> ...	2	2	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Excision of part of Capsule																	
of Knee ...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
For Reduction of Dislocated																	
Phalanx ...	1	1	...	1	1	...	...	...	...	...	...	1	...	...	...	...	...
AMPUTATIONS.																	
Primary—																	
Arm ...	2	...		2
Forearm ...	2	...		2
Hand... ..	2	...		2
Finger ...	10	3	...	10	3	4	1	2	2

TABLE II. (continued).

[illegible]

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[illegible]

TABLE II. (continued.)

[illegible]

AGE AND SEX.

OPERATIONS.	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON LARYNX AND TRACHEA (<i>continued</i>).																								
Tracheotomy (<i>continued</i>)— For Lympho-sarcoma of Neck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Edema of Glottis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sarcoma of Larynx	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sarcoma of Thyroid Gland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scald Larynx	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Post-Pharyngeal Abscess	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thyrotomy— For Laryngeal Stenosis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
OPERATIONS ON NERVES.																								
Suture of Nerves—																								
Primary—																								
Ulnar	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Secondary—																								
Median	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Excision of Nerves—																								
Ulnar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ulnar Nerve freed from Scar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Division of Nerves—																								
Inferior Dental	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spinal Accessory	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE II. (*continued*).

OPERATIONS.		AGE AND SEX.															
		TOTAL.		Discharged.		Died.		Under 5 Years.		- 10.		- 20.		- 30.		- 40.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON NERVES (<i>continued</i>).																	
Stretching of Nerves—																	
<i>Inferior Dental</i> ...	1	1		1	1	...	...	...	...	...	...	...	...	...	...	...	...
<i>Posterior Cervical</i> ...	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Spinal Accessory</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Supra Orbital</i> ...	...	1		...	1	...	...	...	...	...	...	...	...	...	...	...	...
OPERATIONS ON THE VAS- CULAR SYSTEM.																	
Ligature of Arteries for Aneurism—																	
Brachial, Radial and Ulnar— (<i>For Anterio Venous</i> <i>Aneurism</i>) ...	1	...		1	...	...	...	...	...	...	...	...	...	...	...	...	...
Common Carotid— (<i>For Aneurism of Ester- nal Carotid</i>) ...	...	1		...	1	...	...	...	...	...	...	...	...	...	...	...	...
Carotid and Subclavian— (<i>For Thoracic Aneurism</i>)	1	...		1	...	...	...	...	...	...	...	...	...	...	...	...	...
Extirpation of Traumatic Aneurism—																	
<i>Posterior Tibial</i> ...	1	...		1	...	...	...	1	...	...	...	...	...	...	...	...	...
<i>Temporal</i> ...	1	...		1	...	...	...	...	...	...	...	...	...	...	...	...	...
Ligature or Excision of Varicose Veins ...	33	20		33	20	...	...	...	...	...	...	5	1	19	13	2	1
Transfusion ...	2	...		2	...	...	...	...	...	...	...	...	...	2	...	...	...

AGE AND SEX.

OPERATIONS.	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON GENITO- URINARY ORGANS.																								
Circumcision ...	14	...	14	...	...	...	5	...	2	...	4	...	2	...	...	...	...	3	...	...	1	...	...	...
Nephrotomy ...	4	10	4	8	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nephrectomy— (Abdominal)	1	2	...	2	1	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...
Nephro-Lithotomy (Lumbar)	...	1	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Nephro-Lithotomy	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nephrorrhaphy	...	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lithotripsy ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lithotomy— (Perineal)	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Supra-pubic)	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Cystotomy— (Perineal)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Supra-pubic)	1	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Castration— For Herniocele	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Malignant Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Retained Testis	3	...	3	...	...	...	...	...	...	...	1	...	2	...	...	...	1	...	...	...	...	1	...	...
" Tubercle	3	...	3	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Erosion of Tuberculous Testis	2	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Transplantation of Retained Testis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ligature of Varicocele— (Open Method)	4	...	4	...	...	3	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
(Subcutaneous)	28	...	28	...	...	...	...	...	...	...	9	...	18	...	...	...	...	...	...	...	...	...	...	...
Excision of Sac of Hydrocele	17	...	17	...	...	...	1	...	1	...	7	...	9	...	2	...	4	...	...	...	...	...	1	...
	17	...	17	...	...	...	...	...	...	...	3	...	4	...	...	...	...	...	...	...	...	...	...	...

TABLE II. (continued).

AGE AND SEX.

OPERATIONS.	TOTAL.		Discharged.		Died.		Under 5 Years.		- 10.		- 20.		- 30.		- 40.		- 50.		- 60.		- 70.		Over 70.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON GENITO-URINARY ORGANS (<i>continued</i>).																								
Excision of Hydrocele of Cord	4	...	4	...	...	...	...	...	1	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...
Excision or Incision of Hæmatocele...	7	...	7	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...
Excision of Vas Deferens	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Internal Urethrotomy	9	...	9	...	...	...	...	...	...	...	1	...	...	...	...	4	...	2	...	1	...	...	1	...
External Urethrotomy— For Calculus in Urethra	2	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
" Ruptured Urethra	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
" Stricture	4	...	4	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	1	...	...	...	...
Removal of Urethral Caruncle	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Operations upon Female Genital Organs performed in the Gynecological Wards*—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Dysmenorrhœa	...	7	...	7	...	...	...	...	...	...	...	1	...	2	...	4	...	2	...	...	...	...	...	...
" Pelvic Abscess	...	3	...	3	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...
" Removal of—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...
(Carcinoma of Cervix	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...
Carcinoma of Vulva	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Innocent Tumours of Vulva and Vagina	...	10	...	10	...	...	...	...	...	...	...	3	...	3	...	2	...	1	...	5	...	1	...	...
Uterine Polypus	...	19	...	19	...	...	...	...	...	...	...	...	...	1	...	6	...	6	...	...	...	1	...	...
OPERATIONS ON THE RECTUM AND ANUS.																								
Anal Fissure or Ulcer Incised	2	6	2	6	...	...	...	...	...	...	1	...	1	2	1	...	...	3	...	...	...	...	...	...
Anal Ulcer Scraped	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

* Excluding Abdominal Section and Vaginal Hysterectomy.

TABLE II. (continued).

OPERATIONS.	AGE AND SEX.																								
	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
COLOCTOMY.																									
Inguinal—																									
For Carcinoma—																									
Of Transverse Colon	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Sigmoid Flexure	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Rectum	9	4	7	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Fibrous Stricture of																									
Rectum	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
ABDOMINAL SECTION.																									
	For Tuberculous Peritonitis ...	2	1	2
For Perforative Peritonitis—*																									
(From Gastric Ulcer)	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(" Typhoid Ulcer)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For supposed Gastric Ulcer	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Hydatid of Liver	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cholecystotomy	...	8	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cholecystectomy	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Abscess of Liver...	4	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Abscess of Spleen	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Intra-abdominal Abscess	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Pelvic Abscess	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Cyst of Pancreas...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gastrostomy	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gastro-Enterostomy	2	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

* Other cases under Appendicitis, &c.

TABLE II. (continued).

OPERATIONS.	AGE AND SEX.															
	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
ABDOMINAL SECTION (continued).																
For Acute Intestinal Obstruction—																
Strangulation by Band ...	1	2	...	2	1	...	1	...	...	...	...	1	...	...	...	...
Strangulation through Hole in Omentum ...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
For Intussusception ...	...	3	...	1	...	2	...	1	...	...	...	...	...	...	...	...
For Acute Enteritis ...	1	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...
For Appendicitis—																
I. (Acute, without external suppuration)—																
Exploratory Incision ...	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...
II. (Acute, with suppuration)—																
a. A free Incision into general peritoneal cavity, removal of Appendix, washing out and drainage	2	...	1	...	1	...	...	...	...	2	...	...	...	...	...	...
b. Free Incision and washing out, but no search for Appendix ...	4	1	...	...	4	1	...	1	...	2	...	...	1	...	...	...
c. Free Incision and drainage, no washing out, no search for Appendix ...	1	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...
d. Free Incision, local sponging, no search for Appendix ...	1	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...

AGE AND SEX.

OPERATIONS.	TOTAL.		Discharged.		Died.	Under 5 Years.	-10.	-20.	-30.	-40.	-50.	-60.	-70.	Over 70.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
ABDOMINAL SECTION (<i>continued</i>).														
Appendicitis (<i>continued</i>)— (Acute, with suppuration)														
(<i>continued</i>)—														
e. Limited Incision through peritoneal adhesions, no removal of Appendix ...	6	7	4	7	2	...	...	4	5	1	...	...	1	2
III. (Chronic, with Abscess)—														
a. Free Incision, removal of Appendix, local sponging and drainage ...	1	1	...	...	...	...	...	1	1	...	...	...	...	...
b. Limited Incision through adhesions, no search for Appendix ...	1	...	1	...	...	...	...	...	...	1	...	...	...	...
(Chronic recurrent, without external suppuration)—														
Free Incision, removal of Appendix ...	8	5	8	5	...	...	...	1	1	5	2	2	...	...
Enterotomy ...	2	1	...	...	2	...	...	...	1	...	...	...	...	...
Enterectomy ...	2	4	1	3	1	...	...	1	...	...	...	...	...	...
For replacement of Prolapsed Viscera after Colotomy ...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
For Erasion of Tuberculous Gland in Mesentery ...	1	...	1	...	...	...	1	...	...	...	...	...	...	...
For Hæmorrhage after Radical Cure of Hernia ...	2	...	2	...	...	...	...	...	...	1	...	...	...	...

TABLE II. (continued).

OPERATIONS.	AGE AND SEX.															
	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
ABDOMINAL SECTION (continued).																
For Hæmorrhage into lesser peritoneal sac ...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
For insertion of Wire into Aortic Aneurism ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
For Rupture of Bladder ...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Hysterectomy— (Abdominal)— For Fibroid ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Vaginal)— For Carcinoma ...	10	...	...	9	...	1	...	...	...	...	...	2	...	...	...	...
Hysteropexy ...	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	...
Removal of Uterine Fibroid...	...	1	...	1	...	1	...	...	...	...	...	...	...	1	...	...
Removal of Uterine Appendages... ..	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...
For Extra-Uterine Gestation	...	3	...	2	...	1	...	...	...	...	...	...	...	1	2	...
Oöphorectomy... ..	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Ovariectomy— For Innocent Tumour ...	...	35	...	33	...	2	...	...	...	...	...	...	...	8	7	13
" Malignant Disease	...	2	...	1	...	1	...	...	...	...	...	...	...	1	...	1
Exploratory— For Calculus in Ureter ...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...
" Contus on of Abdomen	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
" Intestinal Obstruction	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Malignant Disease ...	6	8	...	6	...	2	...	...	...	...	1	...	...	2	...	1

AGE AND SEX.

OPERATIONS.	TOTAL.		Discharged.		Died.		Under 5 Years.		—10.		—20.		—30.		—40.		—50.		—60.		—70.		Over 70.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
ABDOMINAL SECTION (continued).																								
Exploratory (continued)—																								
For Procidencia Uteri ...	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
" Pyo-nephrosis ...	1	1	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
" Supposed Enlarged Gall Bladder ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
" Suppurating Cyst of Kidney ...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
" Supposed Ovarian Tumour ...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...

STATISTICS OF ANÆSTHETICS.

During the year 1897, Anæsthetics were administered 4,893 times.

Chloroform	...	...	...	...	...	...	1,959	times.
Gas and Ether	...	...	...	...	...	...	1,261	„
Gas	...	...	...	...	...	...	965	„
Gas and Oxygen	...	...	...	...	...	...	477	„
Ether	...	...	...	...	...	...	201	„
Mixture of Chloroform and Ether	...	...	...	...	...	...	30	„
Total	...	...	...	...	...	...	<u>4,893</u>	<u>times.</u>

There were two deaths, both during chloroform administration.

1. Man, aged 56, who had been gradually reduced in health by respiratory obstruction, due to a tumour partially blocking the upper opening of the larynx. Tracheotomy had been performed. It was proposed to examine the larynx, and chloroform was used because the lungs were considerably engorged. After a few inhalations, and before the operation had been begun, the patient became convulsed, and died during the convulsion. (v. 2178.)

2. Man, aged 57. Chloroform was being administered for an operation upon a hallux valgus. The operation had not been begun when the patient suddenly died. The post-mortem showed extensive old disease of the lungs and pleura. (i. 2226.)

APPENDIX TO TABLE II.

Table II. includes not only all operations performed upon patients in the Surgical Wards, but also those performed upon patients in the Medical and Gynæcological Wards. The latter cases do not appear in Table I. In this Appendix, as in the previous one, all fatal cases and many of the more important of the other cases are described.

OPERATIONS ON THE EYE.

A boy, aged 10, was admitted with high myopia (over 20D) of both eyes. Both lenses were removed after discission, with the satisfactory result that the boy had good vision for distance without glasses, and became slightly hypermetropic. (Ophthalmic Register, No. 782.)

Another case of high myopia in a boy, aged 8, was treated successfully in a similar manner. (Ophthalmic Register, No. 1657.)

A girl, aged 15, had had for three months ptosis and pain in the eye; for one month there had been swelling in the region of the lachrymal gland. The latter was removed, and on microscopical examination was found to be tuberculous. (v. 1405.)

PLASTIC OPERATIONS.

For Cleft palate.

A male infant was operated upon at the early age of 10 months; a portion of the cleft was closed, but the central part of the line of union broke down; three months later another operation was performed, but with no improvement. (v. 1792 and 2760.)

For Hypospadias.

A labourer, aged 22, was admitted with a curious congenital malformation of the urethra. The penis and testicles were ill-developed. The meatus was on the under-surface of the glans, and so small that it barely admitted a probe. The corpus spongiosum appeared to be quite absent, the wall of the urethra being so thin that a probe passed into its interior could be seen through the very thin wall. Three weeks before admission this thin wall gave way, and all the urine was afterwards passed through this opening, a quarter of an inch in diameter, about an inch behind the glans. The patient stayed in the hospital seven months; during this time five plastic flap operations were performed, but owing to the thinness of the urethral wall, the patient was little, if at all, improved. (iii. 280.)

For Recto-vesical fistula.

A labourer, aged 31, was admitted for recto-vesical fistula. At the age of 19 he had undergone lateral lithotomy for stone at another hospital; a fistula had existed ever since. Ten years ago an operation had been performed upon the fistula in this hospital without permanent success. On admission the fistulous opening was a quarter of an inch in diameter, and most of the urine passed through it. A second plastic operation was performed, the edges being pared and united by silver wire, which avoided the mucous membrane of the bladder. A catheter was tied in. On the fifty-eighth day the stitches were removed; the fistula was much smaller, only just admitting a fine probe. Three weeks later he left the hospital, still passing a little water per rectum, but on the whole greatly improved. (iv. 2961*.)

Rhinoplasty.

A female child, aged 2½, was admitted for a deformity of the nose, the left ala being separated from the tip by a longitudinal slit a quarter of an inch in length. This was the result of the injudicious cauterisation of a nævus at the age of three months. A plastic operation was performed with a good result. (iv. 2097.)

The brewer whose case is described on page 157 of last year's report was readmitted, and underwent a further trimming operation. (ii. 3695*.)

For Ruptured perineum.

Eight of these were performed in the Gynæcological Ward, and five in the General Wards.

EXCISION OF BONES AND JOINTS.

Excision of the Astragalo-scaphoid joint.

A somewhat unhealthy-looking labourer, aged 32, was admitted with very bad flatfoot; the sole of the foot was slightly convex, and the patient had a good deal of pain. Ogston's operation of removal of part of the astragalus was performed, and the foot put into a good position. Esmarch's bandage was used and strict antiseptic precautions were, of course, adopted; the wound was washed out with 1 in 2,000 perchloride of mercury lotion. The foot was put up in plaster. On the following day the patient complained of a good deal of pain, which soon subsided. On the fifth day the temperature, hitherto normal, began to rise. The plaster was removed and some blood clot pressed out from the outer side of the foot. Some dulness at the base of the right lung was now discovered. The patient became very ill. On the following day the whole foot was gangrenous, so amputation was performed through the middle of the leg, but the patient died next day, on the ninth day after the first operation. There was no post-mortem, and the source of infection was never clearly ascertained. (i. 334.)

Excision of the elbow.—This operation was performed six times, four times for tuberculous disease and twice for ankylosis.

For **TUBERCLE.**—A man, aged 37, with disease of several years' duration; there was considerable swelling, but no external suppuration or raised temperature. A good result ensued. (iv. 2005.)

A woman, aged 29, with considerable disease of seven years' duration; the disease was in a quiet state. The temperature was normal both before and after the operation. The patient made a good recovery, the wound healed, and mobility of the joint through an angle of 45° was obtained. (i. 1716.)

A woman, aged 18, with disease of seven months' duration ; sinuses existed. When the patient left the hospital the wound was nearly healed, there was free movement at the elbow, but very little strength in the arm. (i. 1554.)

A girl, aged 16, with extensive disease of one year's duration and sinuses. In the operation the olecranon was preserved and wired to the shaft of the ulna. The case did not do well, and the olecranon had subsequently to be removed. The patient left the hospital a month after the operation with the wound unhealed. (ii. 1798.)

For ANKYLOSIS.—A girl, aged 14, had been in the hospital six years previously on account of tuberculous disease of the elbow ; an abscess had been opened and the disease cured, the elbow becoming stiff. On admission, the elbow was quite fixed at an angle of 120° ; there were no signs of active disease. The patient left the hospital on the eighty-eighth day after the operation, the wound having then healed ; there was slight movement of pronation and supination. (ii. 2506*.)

A boy, aged 9, was admitted with ankylosis of the elbow following necrosis of the lower end of the humerus five years previously. Excision of the elbow was performed and the olecranon wired. The operation was followed by slight suppuration and necrosis of the olecranon. The patient left the hospital on the one hundred and eighth day after the operation, able to move the elbow a little ; there were still two small sinuses. He was subsequently readmitted. (ii. 3136*.)

Excision of the hip.—Performed twice, with one death.

A boy, aged 9, who had previously been under treatment for caries of the spine and psoas abscess, was readmitted for sinuses about the hip ; after some months it was found that the suppuration had also involved the hip joint. A large abscess was opened and the carious head of the femur removed. The patient did well, and left the hospital three months after the operation with the sinuses nearly healed. The temperature was rarely above 100° at any time before or after the operation. (iii. 3150*.)

A woman, aged 39, was admitted with suppurative disease of the hip joint of about two years' duration. There was much thickening about the hip, and there was one sinus. Excision was performed, and on two subsequent occasions counter-openings were made, but the suppuration continued, and the patient died of exhaustion three months after admission ; there was no post-mortem. (iii. 1370.)

Excision of the shoulder.— Performed once for tubercle, once for old fracture.

A painter, aged 34. Ten years previously he had had some inflammation of the shoulder, which had subsided ; six years later he again had pain and stiffness in the shoulder ; this continued on and off until three months before admission, when the shoulder was wrenched at an infirmary. Since that time he had been much worse. On admission there was considerable pain and swelling about the shoulder, with a chronic abscess at the back of it. The joint was excised and found to be much diseased. The patient made a good recovery, and left the hospital on the thirty-fifth day after the operation ; the wound was nearly healed. (iv. 154.)

A bricklayer, aged 46, was admitted for a fracture of the surgical neck of the humerus nine weeks old. There was much pain and deformity. Excision was performed three weeks later, and the patient was greatly improved. (iv. 1135.)

Excision of the lower jaw (partial).—Performed three times for epithelioma, once for recurrent multilocular cystic tumour.

A woman, aged 59, with a ten years' history of epithelioma; five years ago a first operation for its removal had been performed. On this occasion a recurrent nodule as large as a walnut was removed, together with a portion of the lower jaw. She made a good recovery. (iii. 310.)

A man, aged 59, who had undergone four operations for epithelioma of the tongue in the last nine months, was readmitted with an ulcer as large as a shilling close to the anterior pillar of the fauces. There were no enlarged glands. The growth was removed, together with an inch of the lower jaw in its whole thickness, near the angle. The patient made a good recovery. (ii. 3014.)

A man, aged 43, had for one month noticed looseness of the lower front teeth; a week later some swelling was noticed inside the lower lip. On admission he was in fairly good general health; there was a large mass of epithelioma involving much of the body of the lower jaw and some of the skin of the chin, as well as part of the floor of the mouth. The body of the jaw with the whole growth was freely removed; both facial and lingual arteries were tied in the course of the operation. The remaining portions of the jaw were wired together. The man made an excellent recovery; the wires were removed on the forty-second day, and the patient left the hospital on the sixty-fourth day after the operation. (iii. 96.)

A waterside labourer, aged 32, was readmitted with a very large multilocular cystic tumour of the lower jaw. Seven and a half years ago it had first been noticed; five years ago most of the right half of the lower jaw had been removed. Two years ago recurrence had first been noticed, and the tumour had grown steadily ever since. In 1895 he had been in the hospital for a short time, but refused to submit to any operation. On admission there was a huge prominent slightly lobulated tumour extending from the symphysis menti to the middle of the temporal fossa, and from the ear to the middle of the cheek. The skin over it was normal, the zygoma was expanded over the tumour. The whole tumour was removed together with about two inches more of the jaw. The operation was a very large one, but not particularly difficult. For a few hours afterwards there was considerable collapse; the patient then made an excellent, although somewhat slow, recovery, convalescence being delayed by several small abscesses in the large wound. The tumour was a typical example of multilocular cystic disease. When last seen, ten months later, his general and local condition were both excellent, and there was very little deformity. The left half of the jaw had become only very slightly displaced, and he could masticate well. (iii. 2875*.)

Excision of the upper jaw (partial or complete).—Performed ten times, for malignant disease in each case.

There was one death.

A man, aged 40, had had for six months pain and swelling about the upper jaw, and for six weeks some ulceration about the gum. On admission there was a considerable mass of growth projecting forwards, and also into the mouth, and pushing the eye upwards. The whole upper jaw was removed, and the growth found to extend into the sphenomaxillary fossa. The removal was satisfactory, and the patient made a rapid recovery. He was subsequently readmitted to have some enlarged glands in the neck removed. (v. 2786.)

A baker, aged 45, with a boring epithelioma of three months' duration, made a good recovery after removal of the upper jaw; part of the orbital plate was left. (ii. 2683.)

A collier, aged 54, also made a good recovery after removal of the jaw for an extensive epitheliomatous tumour of three months' duration. (v. 20.)

An artificial florist, aged 57, also made a good recovery after a similar operation. The growth, which was very extensive, had existed for three months. Some months later he was readmitted with recurrence. (i. 692.)

A man, aged 57, made an excellent and rapid recovery after removal of the whole upper jaw for epithelioma; for four months he had had swelling of the cheek and some dull pain. The growth involved chiefly the anterior wall of the antrum. (i. 2442.)

A nurse, aged 36, was admitted with a swelling of the upper jaw. Five months previously she had first noticed aching pain in this region, followed quickly by a swelling which had gradually increased in size. On admission there was a prominent tumour as large as a walnut attached to the right upper jaw. Partial excision of the jaw was performed, the orbital and alveolar plates being left untouched. The patient made a good recovery from the operation, and left the hospital a month later. The tumour, which involved chiefly the anterior wall of the antrum, was found microscopically to be a carcinoma. (iv. 2003.)

A woman, aged 51, who had two months previously undergone an operation for the local removal of an epithelioma of the upper jaw, was readmitted with recurrence. The whole upper jaw was removed, and the patient recovered; but further recurrence had taken place before the patient left the hospital, four months after admission. (i. 2105*.)

A cook, aged 69, had had an epithelioma of the upper jaw for six weeks. Partial removal of the jaw was performed, and she made a good recovery. (v. 2844*.)

A carman, aged 39, was admitted with a tumour of five months' duration, involving chiefly the anterior part of the upper jaw, but also blocking the nostril and protruding into the mouth. The whole upper jaw was removed, but recurrence took place before the patient left the hospital, a month after admission. Microscopically the growth was found to be sarcomatous. (iv. 1645.)

The only fatal case was that of a washerwoman, aged 65, who was admitted with a prominent sarcoma. Eighteen months previously she had first noticed obstruction of one nostril and a small swelling at the side of the nose; the swelling had gradually increased, and in the last month had become painful. There had never been any hæmorrhage. The patient was not in good condition, and the propriety of operating was at first questioned on account of a large painless moveable mass in the right loin, which some thought might be a secondary growth; it was, however, finally considered to be an enlarged kidney, and the upper jaw was removed. The operation was an extensive one, and the patient died two days later of pneumonia. The post-mortem showed that the growth had been completely removed, except at one small place where the tumour had extended through the sphenoidal fissure into the interior of the cranium. The swelling in the loin was composed partly of a dilated gall bladder with calculi, and partly of a lobe of the liver distorted by old tight lacing, and pushed down so as to occupy exactly the position of the kidney. There was also some chronic interstitial nephritis. (v. 1351.)

Excision of the knee was performed six times for tuberculous disease, three times for ankylosis and once to stiffen a paralysed limb.

For TUBERCLE.—In five cases there was no external suppuration; the disease had lasted two, three, many three and ten years respectively. The patients were men aged 37 and 26, and women aged 25, 27 and 29 respectively. In the first four cases steel pins were inserted and kept in for periods varying from eleven to twenty-five days. In the fifth case the patella was cut across and subsequently wired. All these five cases made excellent recoveries; but in the first of them there were still signs of disease when the patient left the hospital. (Male iv. 77, 1940; Female iv. 1934, iii. 1298, ii. 532.)

The sixth case was that of a boy, aged 15, who had had subacute disease for seven years: there were four sinuses. Excision was performed by Mr. Lockwood's method of dovetailing the bones together; the result was excellent, the boy leaving the hospital six weeks after the operation with the wound soundly healed and the limb in good position. (v. 601.)

For ANKYLOSIS.—A man, aged 22, a woman, aged 40, and a girl, aged 13, underwent excision for ankylosis and deformity following old tuberculous disease eighteen, five and five years previously; all did well. (Male iii. 306; Female iv. 2622*, v. 1676.)

For PARALYSIS.—The only fatal case among the excisions was that of a girl, aged 6, who was admitted with a wasted and paralysed lower limb, the result of infantile paralysis. Excision was performed with the object of fixing the knee, the patella being divided and the articular cartilages of the joint cut away. The bones were then wired together. During the operation there was trouble with the anæsthetic, and artificial respiration had to be performed. Suppuration followed, and numerous incisions had to be made into the thigh to let out pus. Empyema then occurred, and finally the patient died on the twenty-sixth day after the operation. (i. 2409.)

Excision of the head of the metatarsal was performed four times for hallux valgus.

Excision of the os calcis was performed once on a boy, aged 17, for tuberculous disease of sixteen months' duration with sinuses. (iii. 1017.)

Excision of the head of a phalanx was performed four times for hammer toe.

Excision of part of the radius was performed upon a woman, aged 31, for an endosteal sarcoma of fifteen months' duration; the tumour was about two inches in diameter, and was situated at the lower end of the bone. A good recovery followed, but six months later the patient was readmitted with recurrence, and amputation was performed through the forearm. (v. 900 and 2509.)

The head of the radius was excised from a boy, aged 17, on account of an unreduced dislocation of two and a half years. (ii. 268.)

Excision of one or more ribs was performed eighteen times. Thirteen of the cases were in the medical wards, and do not appear in Table I.; of these, in twelve the operation was for simple pleuritic effusion or empyema; the thirteenth was a case of hepatic abscess, complicated by rupture into the lung and empyema. Four patients, including the last mentioned, died.

Of the five cases under the care of the surgeons, two were cases of old empyema, for which multiple excision of ribs (Estlander's) was performed. (Male iv. 2554* and Female v. 2119); another was that of a boy, aged 7, who had swallowed a pin, which stuck in his pharynx and produced much dyspnoea. He was brought at once to the hospital; the pin was felt by the house surgeon and was dislodged, but could not be extracted. Pneumonia of the right lung soon set in, and for some weeks the boy was very ill. Five months after admission an empyema was found on the right side; for this a piece of rib was resected, much fetid pus being let out. The boy then gradually made a good recovery, and left the hospital six months after admission. (i. 2180*.)

The fourth case was one of pleural effusion and probable abscess of the lung, in a woman, aged 33.

All these four recovered.

The fifth case was that of a soldier, aged 26, who had been in India six years, and who was admitted with an abscess in the liver; the symptoms of this had existed for nearly six weeks. Shortly after admission (to a medical ward) the abscess ruptured into the lung. On the following day a portion of the eleventh right rib was resected and the abscess opened and washed out. Suppuration continued, the temperature remained high, and the patient died twenty-two days after the operation. The post-mortem showed many small collections of pus in different parts of the liver. There was no intestinal ulceration. (ii. 332).

OPERATIONS ON BONES.

Osteoclasia was performed eleven times for genu valgum, six times for rickety curvature of tibia and fibula, and once for old fracture, with good results.

Osteotomy.—**ASTRAGALUS**.—Through the neck of the bone for talipes varus, in a boy, aged 3. (i. 1022.)

FEMUR.—In three cases for anklyosis of the hip, by the infratrochanteric method, with good results. (Male i. 3055, ii. 2931; Female iv. 2270.)

In two cases through the shaft of the femur for old fracture, with good results. One was a boy, aged 17, the other a boy, aged 9. The latter had been admitted with a fracture of the femur just above the condyles, produced by a cabwheel. A long Liston and weight extension were applied, but at the end of two months the fragments were found to be in a bad position. On the sixty-seventh day after the accident the seat of fracture was freely exposed, much callus cut away with a chisel, and the fragments with much difficulty put into good position. An attempt to wire them together had to be abandoned on account of mechanical difficulties. The boy made a good recovery, and left the hospital on the thirty-fifth day after the operation. (v. 2008.)

For genu valgum, four times by the supra-condyloid method, with good results. (Male ii. 2612, iv. 3028, 3177*; Female iv. 1105.)

TIBIA AND FIBULA.—Once for rickety curvature (Male iii. 1939); once for genu valgum (osteoclasia had previously been attempted unsuccessfully) (Female ii. 2211); and once for a badly-united Pott's fracture (Male ii. 1297).

Erasion or gouging of carious bone was performed forty-one times; there were two deaths. A male infant, aged 15 months, was admitted with otitis media of ten months; for fourteen days there had been more acute symptoms, and a mastoid abscess had recently developed. The **MASTOID** was opened and scraped, and for two days the patient seemed to do well. Symptoms of meningitis then set in, and the child died eleven days later. (ii. 3046.)

A delicate boy, aged 15, was admitted with tuberculous disease of the **TARSUS** of four months' duration and a tuberculous abscess of the opposite knee. About the ankle were sinuses which led down to the subastragaloid joint. Eleven days after admission the joint was freely opened, scraped and injected with pure iodoform, and the abscess of the knee was opened. A month later another abscess in the leg was opened. The ankle did fairly well, but the wounds did not heal. Ten weeks after admission drowsiness set in, and vomiting, which had previously occurred only occasionally, now became frequent. The patient gradually sank and died on the eighty-ninth day after admission. The post-mortem showed extensive tuberculous disease of both suprarenals (Addison's disease); the pigmentation inside the cheeks and skin

was not great. The disease of the tarsus was almost limited to the subastragaloid joint, and it was in a quiescent state. There was some tubercle in each lung. (iii. 2106.)

Sequestrotomy.—Performed twenty-six times upon various bones, with one death.

A woman, aged 42, was admitted very ill with necrosis of the great trochanter; the disease had existed twenty years, but had recently become acute. Some dead bone was removed, but the patient died a few days later. The post-mortem showed extensive necrosis of the trochanter and recent acute suppuration in the hip joint. (i. 519.)

Trephining.—**LOWER JAW.**—Performed upon a woman, aged 36, for an inflammatory swelling of doubtful nature (v. 1256); also upon a man, aged 56, who had had for four months pain and swelling in the neighbourhood of the last molar tooth, and a papillomatous ulcer which was at first suspected to be malignant; local removal and microscopical examination failed to show any evidence of malignancy. Trephining of the jaw and the removal of much inflammatory tissue gave considerable relief. (ii. 415.)

MASTOID.—A female clerk, aged 28, who had been successfully trephined for cerebral abscess a year previously (see last year's report, p. 162), was readmitted with further symptoms of otitis media. The mastoid was trephined, with some benefit; she was subsequently readmitted and again trephined for cerebral abscess (see Trephining). (v. 1474.)

One patient died; he was a schoolboy, aged 13, admitted with chronic otitis media and a sinus behind the ear. For nine days he had had vomiting and delirium. His temperature was 102°, pulse 100. There was some retraction of the head, and he was evidently very ill. He was trephined over the lateral sinus, but no pus was found at first. On cutting away bone in front of this trephine hole, a few drops of pus came away. The middle ear was scraped out and drained. The patient gradually became more and more comatose, and died nine days after admission. The post-mortem showed suppurative meningitis starting in the ear; there was no suppuration in the lateral sinus or brain. (iv. 1894.)

(See also other cases described under Erasion of carious bone.)

SKULL.—**FOR ABSCESS OF THE BRAIN.**—The female clerk, aged 28, mentioned under trephining of mastoid, and who had been successfully trephined for cerebral abscess a year previously, was readmitted a second time, because she had recently had a fit and had become drowsy. On admission she was in a drowsy apathetic condition, able to speak, but using the wrong words; she complained of pain in the frontal and occipital regions. Temp. 101°; pulse 112. No optic neuritis. An extradural reaccumulation of pus having been diagnosed, the old wound was reopened and two ounces of foul pus evacuated from between the dura mater and the upper surface of the petrous bone; the wound was drained. The temperature fell slowly, and after three days was normal, and remained so. The headache and drowsiness, however, did not disappear, and ten days after the operation there was paresis of one side of the face with slighter paresis of the right arm and leg; the patient also became completely comatose. The wound was again reopened and a pair of forceps pushed through the old trephine hole into the interior of a temporo-sphenoidal abscess, letting out some three ounces of foul pus. The patient rapidly improved, and at the end of three weeks she was nearly well. The main symptoms—drowsiness and paralysis—then set in again. This time she was trephined over the outer part of the cerebellar fossa, and the original abscess cavity drained more effectually through the new opening.

The patient then made a slow but good recovery, and eventually left the hospital one hundred and one days after admission, somewhat deaf, but able to speak properly and understand all that was said to her. The temperature throughout had rarely been above normal. (v. 1702.)

For CEREBRAL TUMOUR.—There were three cases (one being admitted twice). Two died.

A man, aged 33, was transferred from a medical ward, very ill indeed, and supposed to have a tumour of the right cerebellar hemisphere. For many weeks he had been ill, the chief symptoms being persistent headache, vomiting, double optic neuritis, giddiness, staggering and paresis of various groups of muscles. He had emaciated greatly, and at the time of transference was semi-comatose. An exploratory operation was performed on the right side, the cerebellum being freely exposed and examined; no tumour was found. The man died a few hours later, and at the post-mortem an extensive sarcomatous tumour was found in the substance of the left CEREBRAL hemisphere, and projecting into the left ventricle. (iii. 2768.)

A girl, aged 15, was transferred from a medical ward with symptoms of cerebellar tumour. She had been quite well until eight months before admission; the first symptom was a fit; this was repeated many times afterwards. Seven weeks before admission vomiting began, and a fortnight later headache. She had been treated for a month in a medical ward with potassium iodide, without any improvement. She had optic neuritis, ptosis, paresis of the facial, spinal accessory and hypoglossal nerves, all of the right side. There was some enlargement of the right tonsil and glands of the right side of the neck near the skull. The gait was thought to be staggering. Intra-cranial tumour, probably of the right cerebellar hemisphere, was diagnosed. She was trephined over this region, and the posterior part of the brain very thoroughly examined; she died a few hours later. The post-mortem showed an extensive sarcomatous tumour of the right petrous bone, invading the interior of the skull, pressing on the cerebellum and invading the above-mentioned nerves, but not penetrating the dura mater. The tumour involved also the tonsil and glands of the neck. (v. 1904.)

A publican, aged 43, had been for three years the subject of slight attacks of sensations of "pins and needles" in the right leg; the attacks usually lasted about one minute, and were not accompanied by loss of consciousness. Six months before admission he had a general convulsion, starting in the right leg and attended for the first time by loss of consciousness. Three other similar severe and several slight attacks followed in the next few months. There was no vomiting or headache at any time. No history of syphilis. On admission he seemed a healthy man. There was marked ankle clonus in the right leg and increased knee jerk on the same side. No optic neuritis. The patient complained of slight weakness of the right leg. Two fits having been witnessed, the diagnosis of a meningeal lesion was made, and a month after admission the man was trephined over the leg centre of the left side. An oval lobulated encapsuled tumour was found beneath the pia mater and imbedded in the cortex of the brain, although not infiltrating it. It was removed; some smart hæmorrhage occurred, and the operation was followed by much collapse. After the operation the right arm was in a condition of complete flaccid paralysis for nearly a fortnight. The paralysis then gradually passed off, and the patient made an excellent recovery, leaving the hospital on the sixty-fourth day after the operation, apparently quite well. The tumour was a spindle-celled sarcoma of a low degree of malignancy, having much fibrous tissue in it. Two months later he was readmitted with a recurrence of epileptic fits, affecting chiefly the arm. As it was thought possible that there was a recurrence of the growth, the patient was again trephined, the old wound examined, and some scar tissue dissected off the surface of the brain. No sign, however, of any disease could be found. The patient had a few fits after the operation, but then made a good recovery, and left the hospital fifty-six days after the operation. (iv. 3108* and 715.)

For FRACTURE OF THE SKULL.—Four patients recovered.

A fire-engine driver, aged 24, was violently pitched from his box seat on to his head and was admitted unconscious, and with a hæmatoma over the right temple. Three hours later he had a fit, the eyes and head being turned to the left and convulsive movements occurring in both arms and legs. The left knee jerk was exaggerated. There was no paralysis and no clonus. Three hours later (about six hours after the accident) he was trephined over the right temple, and a fissured fracture found; the dura mater was incised, and several drachms of clear fluid escaped, but no blood was seen. The crown of bone was replaced, and the patient made an excellent recovery. He regained consciousness about twelve hours after the operation. (iii. 1778.)

A man, aged 30, and a boy, aged 9, who had been struck on the head by a poker and a stone respectively, were admitted with compound depressed fractures, and were trephined twelve and eighteen hours after the accident; there was but little evidence of any injury to the brain in either case. Both made excellent recoveries, and left the hospital on the twenty-first and thirty-fifth days after admission. (ii. 3794* and iv. 1675.)

A man, aged 56, who had been a heavy drinker, received a severe blow from a stick on the top of the head; he was knocked down, but only slightly concussed. He was trephined shortly after admission, considerable depression and much splintering of the bone being found. The dura mater was not injured. The patient did well for a fortnight; the wound healed, and the temperature remained normal; he then began to get restless and excited, then delirious, and finally became violently maniacal; he was eventually removed to a lunatic asylum. (ii. 2079.)

Four patients died.

A man, aged 57, fell off a waggon on to his head; he was somewhat stunned, but able to walk to the hospital; he had two lacerated scalp wounds just to the left of the middle line. Six hours later he was unconscious, and breathing stertorously. There was rigidity of the right side and inequality of the pupils. Three hours later trephining was performed, first on the left temple where nothing abnormal was found, then in the right temple where a considerable blood clot was discovered between the dura mater and bone; a large piece of loose bone was removed, and the posterior branch of the middle meningeal artery was tied; a fracture was found to extend downwards into the middle fossa of the skull. After the operation the patient became more and more comatose, and next day he died, the temperature rising to 105.8°. The post-mortem showed a fracture running from the parietal eminence of the middle fossa on the same side. There was no obvious laceration of the brain. No further hæmorrhage had occurred. (ii. 2394.)

A man, aged 42, fell off a cart on to the back of his head. On admission he was conscious, but dull. There was a scalp wound in the occipital region. He gradually became comatose. Three days after the accident he was trephined over the left occipital region; a fissure was found, but no depression. He died shortly after the operation. The post-mortem showed a fissured fracture of the vault on the right side and a large extradural clot; there was much laceration of the brain. (ii. 1435.)

A man, aged 54, was found unconscious in the street; when brought to the hospital he was able to walk, but was very stupid. There was a small scalp wound, but no signs of fracture. Three hours later he suddenly became unconscious, and began to have twitchings of the right arm and leg. Three hours later still he was trephined in the left parietal region; a fissured fracture was found; the posterior branch of the middle meningeal artery was found torn, and was tied. There was also a rent in the lateral sinus, which was plugged. Death occurred three hours later, and at the post-mortem the fracture was found to extend downwards to the centre of the left middle fossa of the skull. (iii. 753.)

A woman, aged 69, fell down some stone steps, was picked up unconscious, and brought to the hospital at once. She soon developed a large hæmatoma in the right parietal region; no fracture could be felt. There was some rigidity of the limbs, but no paralysis anywhere. On the third day she was still unconscious, and slight right facial paralysis was the only new feature of the case. Trephining was performed over the motor area, but nothing abnormal was found. The patient died a few hours later. The post-mortem showed a linear fracture of the right parietal and frontal bones running just below the trephine hole; there was no extradural hæmorrhage, but there was much laceration of the left temporo-sphenoidal lobe and extravasation of blood within the dura. (iii. 1624.)

For TRAUMATIC JACKSONIAN EPILEPSY.—Two patients were trephined; both recovered.

A meat porter, aged 39, had, two years previously, been in the hospital for three months for an injury to the right parietal region. Three months later he had his first fit, and since that time fits had recurred with increasing frequency, at first once a fortnight, latterly several times a day. The fits affected the left arm and leg, and were not accompanied by loss of consciousness. There was some weakness of both these limbs, with a certain amount of spastic rigidity and increase of reflexes. There was much scarring and irregularity of bone in the right parietal region. Trephining was performed over the right arm centre, and a whitish mass as large as a pea was found on the surface of the brain. This was excised and found to be inflammatory (possibly gummatous) in nature. The patient made a good recovery, and left the hospital forty-four days after the operation, quite well, and having had only a few slight fits. (iii. 3748*.)

A man, aged 52, was admitted with aphasia and a suppurating scalp wound of nine days' duration. He had fallen down while drunk. Two days later he became aphasic, and subsequently very violent. After admission he had several epileptiform fits involving the face and arm of the side opposite to the injury. Nine days after admission he was trephined a little in front of the lower part of the fissure of Rolando, and an intradural clot of blood about an inch in diameter was found and removed. No fracture of the skull was at any time detected. The patient rapidly improved, and although a few more fits occurred afterwards, he was nearly well when he left the hospital, two months after the operation. (iv. 1284.)

For MENINGEAL HÆMORRHAGE.—A post office servant, aged 26, at 4 a.m. was struck on the head by a heavy bag; he was partially stunned for a few moments, but did not seem much the worse. He complained of a little headache, but was able to resume his work in the afternoon at the usual hour (4 p.m.). At 7 p.m. he complained of a sudden faintness and a feeling of "something bursting in his head." He went to another hospital, but was not considered bad enough for admission. A few hours later he was admitted in an unconscious state, but not able to answer questions. His left side was partially paralysed, and there was considerable rigidity. On the following day he was quite comatose; the left side was still paralysed, and there were twitchings of the right side; the left pupil was larger than the right. He was trephined over the right fissure of Rolando, and a little blood was let out from beneath the dura mater. The brain was punctured, and about an ounce of blood let out from a cavity thought to be the lateral ventricle. Respiration ceased during the operation, and although the patient was kept alive for four and half hours by artificial respiration, he never breathed again naturally. The post-mortem showed no fracture of the skull, no extradural hæmorrhage, a little hæmorrhage into the subdural space, and a considerable hæmorrhage into the right cerebral hemisphere, just below the cortex and to the outer side of the right lateral ventricle. There was no clear evidence to show whether it was traumatic or spontaneous, but it was probably the former. (i. 1219.)

Elevation of compound depressed fracture.

Two boys, aged 7 and 8, both kicked by horses, made excellent recoveries after this operation. (iv. 1354 and 1969.)

A railway porter, aged 68, was knocked down by an engine and admitted unconscious; several pieces of loose bone were removed at the operation. He never regained consciousness, but died in twenty-two hours. The post-mortem showed the fracture to be quite local; there was no meningitis or intracranial hæmorrhage or laceration of the brain. (i. 3575.)

Pinning fractured bones.

This case is described under amputation through the thigh. (Male iv. 728.)

Wiring fractured bones.

FEMUR.—The case just mentioned was subsequently treated by wiring, and is described under amputation. (iv. 728.)

The only other case is also described under amputation through the thigh. (Male v. 3224*.)

OLECRANON.—A boy, aged 14, with a compound fracture of the olecranon, underwent a successful wiring operation on the day after the injury. (ii. 1898.)

PATELLA.—(PRIMARY.)

Eleven men and three women underwent primary wiring of the patella.

A builder, aged 33, was admitted with an ordinary transverse fracture of the patella; on the eighth day after admission, and the ninth after the accident, the joint was freely opened by a vertical incision, the blood removed, and the fragments united by two silver wires; one of the wires cut through the bone as it was being tightened and had to be re-inserted. On the day after the operation an attack of pneumonia began, and lasted a week; after this the patient did very well. On the twenty-sixth day after the operation the leg was put in plaster. Seventeen days later passive movements were begun. The fragments were firmly united. The patient left the hospital on the seventy-sixth day after the operation. When seen a month later he could walk excellently, and there was little or no pain or stiffness. (iii. 3697*.)

A carman, aged 46, with a similar fracture, underwent wiring on the fifteenth day; the operation was delayed on account of delirium which was present in the first few days. Two silver wires were inserted sagittally, and the joint drained for two days. Primary union occurred, and the patient was discharged with the leg in plaster of Paris on the eighteenth day after the operation. (iii. 1779.)

A porter, aged 34, was treated similarly with one wire on the ninth day. Primary union occurred; the patient was allowed up on the twenty-eighth day, and went out next day, able to bend his knee through an angle of 30°. (iv. 1653.)

A gasfitter, aged 31, was admitted with a simple transverse fracture caused by direct violence. On the eighth day the patella was sutured with a single stout silver wire passed sagittally through the fragments. Primary union occurred without any trouble, and the knee was put in plaster twenty-four days after the operation, the patient leaving the hospital thirteen days later, and discontinuing the plaster ten days later still. For five months he got about with the knee nearly stiff. He was then readmitted for massage and treatment by hot air bath. The fragments appeared to be soundly united, and the patella was fairly moveable laterally, although the knee could be flexed only slightly. A month after admission, while the knee was being manipulated under gas, the patella broke again (see Appendix I., p. 144, iv. 2364). (iv. 229.)

An ironmonger, aged 18, was admitted fifteen days after breaking his patella by jumping; eight days after admission the fragments were united by a single wire passed sagittally. For the first ten days there was slight elevation of temperature and a good deal of serous fluid exuded from the wound; on the sixth day a small drainage tube was inserted; there was considerable swelling of the knee and leg. A month after the operation, fomentations were applied to the knee. A fortnight later the wound had healed, and soon afterwards the knee was put in plaster. The patient left the hospital on the sixty-ninth day after the operation, quite well, but with much stiffness of the knee. (iv. 672.)

An accountant, aged 40, was admitted with a recent fracture of the patella. He had broken the same patella in different places seven and eight years previously. On the third day a wiring operation was performed, the recent and one of the old fractures being sutured with silver wire. The joint was drained for two days. The patient made a excellent recovery, and left the hospital on the twenty-sixth day after the operation. When seen again a month later there was fair movement in the joint, and the patient could walk well without a stick. (v. 1389A.)

A barman, aged 35, addicted to drink, was admitted with a recent fracture of the left patella and an old one of the right. Twelve days after admission (the delay being due to the patient's general condition), the left patella was sutured with two silver wires. The skin incision in this case was transverse. On the thirteenth day the splint was removed, on the twenty-third the patient was allowed up, and ten days later he left the hospital, walking well without a stick. (v. 1706.)

A traveller, aged 36, with a recent transverse fracture, caused by direct violence, was treated on the fourth day by suture with one wire; he was discharged on the twenty-eighth day, able to get about, but with the knee somewhat painful and swollen. (iv. 2143.)

An undertaker, aged 39, was treated in a similar manner on the fifth day, and discharged on the thirty-fourth. (i. 3254.)

A horsekeeper, aged 42, was treated in a similar manner on the seventh day, and discharged on the thirty-seventh. Some weeks later there was considerable stiffness and tenderness around the wire, which could be both seen and felt. (i. 2704.)

A decorator, aged 44, was treated on the eighteenth day by a single wire passed *coronally* through the fragments. He was discharged on the thirty-fifth day, able to bend the knee to a considerable extent. (ii. 2711.)

A woman, aged 42, was admitted two weeks after the injury and sutured, a fortnight later still, by two wires passed sagittally; she was discharged three weeks after the operation. She was readmitted later with much stiffness about the knee. (ii. 1483 and 1968.)

A woman, aged 44, was sutured on the twenty-sixth day with a single wire passed sagittally. Good primary union occurred, and the patient was discharged on the thirty-third day after the operation; there was then a little movement in the knee. (iv. 1851.)

A woman, aged 45, was treated in a similar manner on the second day, and had good movement when discharged on the twenty-fifth day after the operation. (iv. 1525.)

SECONDARY.—A barber, aged 38, was admitted with a double transverse fracture of the patella; the lower fracture had been produced eleven years ago, and was united by half an inch of thick fibrous tissue; the upper fracture was three months old, and had apparently not been treated at all; it showed little or no sign of union, the fragments being two inches apart; they could not be approximated. A single wire was passed coronally through all three

fragments ; the opposing surfaces of the two upper fragments were freshened, but not the others. The upper fragments were just brought into apposition by dint of much traction. Primary union occurred, and when the patient was discharged, twenty-five days after the operation, he could bend the knee about 20°. (ii. 2558.)

A woman, aged 41, was admitted with a recent fracture of the left patella, and a fracture of the right patella ten months old. The latter had been treated at home by lotions and rest in bed for fifteen weeks (no diagnosis of fracture having, apparently, been made). The recent fracture was treated by plaster of Paris, and the old one, a month after admission, by wiring ; the fragments, which were three-quarters of an inch apart, were united by a single wire passed coronally through the fragments. Primary union occurred, and the patient left the hospital with both knees in plaster, on the thirty-sixth day after the operation. (ii. 732.)

A woman, aged 39, with a fracture ten months old, was treated by a single wire passed sagittally ; she left the hospital thirty-three days later with the knee in plaster. (iv. 833.)

All these operations, both primary and secondary, were open ones, and the fracture in every case was simple and transverse.

TIBIA.—A boy, aged 9, with an ununited fracture of the tibia of six years' duration, did well after removal of a wedge of bone and wiring of the fragments. (i. 1018.)

A man, aged 23, was admitted with a very bad compound fracture of the tibia, with much comminution. An attempt was made to save the limb ; a primary wiring operation was performed, and although extensive necrosis followed, the patient made a good recovery and kept his limb. (v. 607.)

Laminectomy.—A paperhanger, aged 56, was caught by machinery and pitched on to his head. When admitted he had complete paralysis of all muscles below the shoulder ; there was pain and swelling in the lower cervical region. The knee jerks, at first absent, returned in a few hours. In the course of the next few months some power was regained over the limbs, but the patient then began to suffer much from pain and spasmodic contractions of the muscles, and he emaciated greatly. Six months after admission laminectomy was performed in the hope of relieving him of his pain. The operation was partially successful in this respect, but the pain eventually returned, and the patient died one month after the operation. The post-mortem showed a fracture dislocation between the seventh cervical and first dorsal vertebræ, with displacement of the former forwards. The cord had been compressed, but not completely crushed. (ii. 2009*.)

Transplantation of tubercle of tibia.

The girl, aged 15, who had undergone excision of part of the capsule of both knee joints on account of dislocating patellæ (see p. 187, v. 66), was readmitted a few weeks later with recurrence of the symptoms. The tubercle of one tibia was transplanted to a lower position, with a good result. (v. 1009.)

OPERATIONS ON JOINTS.

The only death was after an **ERASION OF THE KNEE**. The patient was a boy, aged 12, who for four years on and off had had considerable thickening of the synovial membrane of the knee, but no external suppuration. All the synovial membrane was freely cut away ; there was pus in the joint and much ulceration of the cartilages. The boy was greatly collapsed after the operation, and died a few hours later. The post-mortem threw no further light on the cause of death. (iii. 1520.)

Excision of capsule of knee.

A girl, aged 14, was admitted on account of looseness of both patellæ, which frequently became partially dislocated and caused her to fall. These symptoms had lasted six years. Both patellæ were found to be unnaturally moveable. An elliptical piece of capsule, two and a half inches by two-thirds of an inch, was removed from the inner side of each knee; the joints were not opened. The patient made a good recovery, and left the hospital on the thirty-first day after the operation. Two months later she was readmitted, and underwent a further operation (see Transplantation of tubercle of tibia). (v. 66 and 1009.)

AMPUTATIONS FOR INJURY.

Primary.

ARM.—Two men, aged 33 and 24, crushed by machinery and in a lift respectively, made good recoveries. The latter had to be transfused with three pints of saline solution on the day after the operation. (iii. 3360 and iv. 1976.)

FOREARM.—Both were machinery accidents. (i. 1042 and ii. 2427.)

There were no primary amputations of any part of the lower limb larger than a toe.

Secondary.

ARM.—A felt-roller, aged 15, was badly crushed by machinery; the musculo-spiral nerve was torn across. An attempt to save the arm was followed by cellulitis and by amputation on the seventy-second day; the patient then made a rapid recovery. (iv. 579.)

THIGH.—A female machinist, aged 20, had been run over by a van, and was admitted with a compound fracture of the tibia, involving the knee joint and accompanied by much laceration of the soft parts about the knee; there was also a simple fracture of the lower third of each femur. The wound was thoroughly cleansed, sewn up and drained, and an attempt made to save the limb. Suppuration, however, took place; the skin sloughed; incisions were made, but the temperature remained high; on the ninth day amputation was performed through the middle of the thigh, but the patient, who was desperately ill before the operation, died a few hours later. The post-mortem showed the usual signs of septicæmia. (v. 1866.)

A painter, aged 58, fell from a window and sustained a simple fracture of the femur at the junction of the middle and lower thirds. He was treated with extension and a long splint. The man appeared to be in rather feeble health. Three weeks after admission, as no signs of union had occurred, the bones were rubbed together and the limb placed on an anterior splint. Five weeks later the Liston's splint was reapplied, together with a tourniquet to keep the fragments together. Still no union occurred. On the one hundred and nineteenth day after admission a wiring operation was performed. The fragments were found overlapping with muscle between them; this was cleared away and the fragments united laterally, one wire passing through them and one encircling them. The patient did badly after the operation; the wound suppurated, and the patient went steadily downhill. On the thirtieth day after the wiring operation the thigh was amputated, but the patient gradually sank and died three weeks later, five and a half months after admission. Examination of the limb showed that very little callus had formed; the wires had cut deep grooves into the bones, and had become quite loose. The post-mortem threw no further light on the case. (v. 3224*.)

A soldier, aged 27, was admitted for an ununited fracture of the femur a little below the middle, caused by being thrown out of a cart five months

previously. The fracture had been a compound one, and had been treated elsewhere by splint and extension for nine weeks. The patient seemed quite healthy in all other respects. There was much overlapping of the fragments. An incision was made down to the seat of fracture, and the bones united by two buried steel pins. More than two inches of bone were resected. The wound did well and the temperature remained normal, but the fracture did not unite; three months later another operation was performed, the bones being wired together; but as this also failed to produce union, the limb was finally amputated just above the seat of fracture. The patient made a good recovery. (iv. 728.)

AMPUTATIONS FOR DISEASE.

Among forty-six amputations for disease four deaths occurred; all these were after amputation of the leg for gangrene.

Arm.—For **SARCOMA**.—A woman, aged 39, underwent amputation for a recurrent sarcoma of the forearm; it had been removed locally at another hospital a year previously. (ii. 2199.)

For **TUBERCLE**.—A man, aged 58, made a good recovery after amputation for extensive tuberculous disease of the elbow. (v. 1393.)

Forearm.—For **RECURRENT SARCOMA OF RADIUS**.—This case has already been described under excision of radius (p. 178). (Female v. 2509.)

Hip.—The only case was that of a girl, aged 18, who had already undergone amputation through the upper third of the thigh for periosteal sarcoma of the femur (see 1896 Report, p. 169), and was readmitted six months later with recurrence in the stump; disarticulation of the stump at the hip joint was followed by speedy recovery, but when seen again ten months later extensive recurrence had taken place. (v. 790.)

Thigh.—For **SEPTIC ARTHRITIS OF KNEE**.—A feeble, delicate boy, aged 4, was admitted with an acute septic arthritis of the knee, which had supervened upon a wound inflicted one week previously. The joint was immediately opened, washed out and drained. As the suppuration continued and the patient became gradually worse and worse, amputation through the middle of the thigh was performed on the eighteenth day after admission. Although the child was extremely ill at the time and actually suffering from pericarditis, he made a rapid and complete recovery, and left the hospital on the forty-seventh day after the operation. (iii. 2533.)

Leg.—A blacksmith, aged 46, was admitted with a large **CHRONIC ULCER** of the leg of ten years' duration. In the centre was a very prominent rounded, firm, rather smooth mass about as large as a hen's egg. This mass had been growing for four years, and was at first thought to be malignant; the glands in the groin were enlarged. The leg was amputated below the knee. Microscopical examination showed that the tumour consisted only of dense fibrous tissue. The glands also showed only inflammatory changes. The patient made a good recovery. (iii. 1449.)

A waiter, aged 36, underwent amputation through the lower third for **Charcot's disease of the ankle** of about two years' duration. The arteries had very thick walls; secondary hæmorrhage took place on the third day and the flaps sloughed, but the wound granulated up, and the patient left the hospital three months later with the wound nearly healed. (iv. 1631.)

For **GANGRENE**, amputation was performed six times.

Two patients recovered.

A cook, aged 22, was admitted to a medical ward with headache, vomiting, high temperature and other symptoms, which had lasted altogether about eight days. The diagnosis was at first doubtful, lying between ulcerative endocarditis and typhoid fever. Eventually the latter diagnosis was made. The patient was very ill. On admission there was œdema of both calves, followed by anæsthesia, and, a week after admission, by gangrene of both feet. Two months after admission she was transferred to a surgical ward; at that time there was well-marked dry gangrene of both feet, extending upwards on the left side to the malleoli on the right to the middle of the foot; the line of demarcation was very well marked. The left leg was amputated through the lower third, and Chopart's amputation was performed on the right foot. The patient made a good recovery, and left the hospital five months after admission. (ii. 2679.)

A woman, aged 54, had had for two years coldness and numbness of the left foot, and for two weeks pain and swelling of the second toe. On admission the patient had a trace of sugar in the urine; the gangrene slowly spread to other toes. Three weeks after admission amputation was performed through the lower third of the leg. The patient made a good recovery, and left the hospital two months after admission. (ii. 2752*.)

Four patients died.

A blacksmith, aged 52, had first noticed blackness of one toe five weeks previously. A fortnight later this was removed locally, outside the hospital; the wound made no attempt to heal, and the gangrene extended into the sole of the foot. In this condition the patient came to the hospital. He was suffering from glycosuria (gr. x.—xxiv. of sugar to the ounce), but not from excessive hunger or thirst; there was some polyuria (about fifty to ninety oz. daily). There was considerable inflammation about the foot, and foul suppuration about the subcutaneous tissue of it. The patient's general condition becoming worse, amputation was, after a consultation, performed just below the knee, on the twenty-fifth day after admission. The flaps, however, sloughed, and the patient gradually sank, dying on the twenty-sixth day after the operation. There was no post-mortem. (v. 2723.)

A Frenchman, aged 60, but looking much older, was admitted with typical dry gangrene of the right foot; there was a well-marked line of demarcation at the ankle and slight redness and œdema of the leg for two inches above this. There was no albuminuria or glycosuria. Five days after admission a dark spot of threatening gangrene was noticed in the toe of the left foot. Amputation was on that day performed through the middle of the right leg by anterior and posterior flaps. The patient's condition, however, did not improve, the flaps sloughed, and he gradually sank and died on the fifteenth day after the operation. The post-mortem showed extensive atheroma of the arteries and old infarcts in the kidneys. (ii. 1862.)

A gardener, aged 71, was admitted with dry senile gangrene of one toe of one month's duration. There was extensive atheroma of the arteries, but no glycosuria or albuminuria; the gangrene slowly spread into the foot, and as the man's general condition became worse, and he suffered great pain, amputation was performed by lateral skin flaps through the upper third of the leg on the twenty-third day after admission. For a few days the patient seemed to do fairly well, but then the flaps sloughed, the temperature began to rise, and the patient sank and died on the eighteenth day after the operation. There was no post-mortem. (iv. 2753.)

The fourth case, that of the man who died after amputation for gangrene set up by an operation for flatfoot, has already been described under the latter heading (p. 174, i. 334).

Penis.—Performed six times for epithelioma. One patient was a man aged only 30. (iii. 1401.) A man, aged 69, had much dementia after the operation. (v. 593.) All recovered.

OPERATIONS ON THE BREAST.

Inflammatory affections.

A woman, aged 35, with chronic mastitis, thought at first to be malignant disease, underwent partial amputation of the breast. (v. 1081.)

A woman, aged 45, who had been confined one year previously, was admitted with a swollen and inflamed breast. The inflammation had lasted three months, and there were sinuses. The latter were laid open, scraped and drained on several occasions, but as healing did not occur the whole breast was eventually amputated, and the patient made a speedy recovery. (iv. 553.)

A woman, aged 41, with chronic mastitis with numerous cysts, underwent amputation of the whole breast with a good result. (ii. 246.)

A single woman, aged 46, had had for several months some irritation about one nipple, and for two weeks had been aware of a slightly painful lump in the upper and outer part of the breast. She was found to have a hard, slightly nodular swelling as large as an ordinary plum. It was not adherent to skin or muscle; the glands in the axilla were slightly enlarged. The tumour was thought to be malignant. The whole breast and most of the great pectoral muscle were removed, and the axilla, which contained some slightly enlarged soft glands, was cleared out. When the tumour was cut into, it was found to be an abscess with much hard tissue around it. The latter when examined microscopically was found to be purely inflammatory. (iii. 1709.)

A married woman, aged 34, who had had six children, the last two years ago, had noticed for eight weeks a hard and somewhat painful lump in the breast. In the lower and outer half of the right breast was a hard tender well-defined swelling, not adherent to skin or nipple. There was an enlarged gland in the axilla. When cut into, the lump was found to contain a drop or two of pus, but the hardness around was considered to indicate scirrhus, so the whole breast and axillary glands were removed. Microscopically, the tumour proved to be tuberculous. The patient made a good recovery. (ii. 1491.)

Galactocele.—Removed locally from a woman, aged 26. (iv. 2353.)

Amputation of whole breast for Carcinoma.—Sixty-five women underwent this operation; in sixty-three cases the axillary glands were also removed at the same time. One patient died.

A woman, aged 65, had had a lump in the breast for eighteen months, for five months it had been ulcerated. On admission the tumour was of moderate size, not adherent to the pectoral muscle, but surrounded by a good deal of inflammatory redness, which subsided after a few days. The whole breast and the axillary glands were then removed. The wound suppurated, and the patient died on the nineteenth day after the operation. The temperature remained between 100° and 101° almost constantly after the operation. At the post-mortem some suppuration was found in the axilla. The removal had been complete; no growth could be found in any part of the wound nor in the glands, nor in any other part of the body. There was some chronic interstitial nephritis. (v. 2887*.)

Of the sixty-four cases that recovered, the only ones worthy of special mention were the following:—

A woman, aged 53, was found to have in different parts of the amputated breast a mass of carcinoma and a fibro-adenoma. (iv. 1857.)

A woman, aged 61, became insane after the operation. (iii. 627.)

A woman, aged 58, who had undergone a very extensive operation for removal of the whole breast, pectoral muscle, &c., left the hospital on the nineteenth day after admission, having apparently quite recovered; but she died of syncope on the way home. (v. 1542.)

A woman, aged 34, was admitted with an ulcerated swelling of the breast. Eight months previously she had weaned a child; the breast, previously healthy, did not involute normally, but remained hard on the surface. Three months later the breast became painful and inflamed, and then, before admission, the breast became ulcerated; at the same time the axillary glands became enlarged. On admission the right breast was large, hard and tender. Just above the nipple were two openings with undermined edges, discharging pus. There was considerable induration of the underlying breast and the axillary glands. At consultations, opinions were divided between tuberculous disease and carcinoma. The case *looked* like one of tubercle, but *felt* more like carcinoma. It was found to be the latter, and the whole breast and glands were removed, with a good result. (iv. 1077.)

A widow, aged 55, was admitted with a scirrhus, which had been noticed for eight months. She was also the subject of well-marked myxœdema, which had been present about a year, but for which she had had no previous treatment. After ten days thyroid treatment, the whole of the breast was removed with the axillary glands; there was no unusual amount of shock or hæmorrhage, and the patient made a good recovery, leaving the hospital on the twenty-fifth day after the operation. The thyroid treatment was continued throughout, and the symptoms of myxœdema became much less marked. (iii. 2846*.)

The two cases in which the axillary glands were not removed were those of women, aged 45 and 68. (i. 1309 and 2094.)

Partial amputation for Carcinoma was performed only once during the year. The patient was a woman, aged 59, with a scirrhus of two months' duration at the outer part of the breast; the axillary glands were removed. (i. 265.)

Local removal of Carcinoma.—A woman, aged 42, was admitted with a small soft tumour of the breast; it was removed locally, and found to consist of broken-down caseous material; it was believed to be inflammatory, but microscopically proved to be carcinomatous. (ii. 1916.)

A woman, aged 53, was admitted with a rounded swelling of four months' duration in the lower part of the breast; the skin over it was red and adherent. When cut into the tumour was found to be breaking down in the centre, and was thought to be tuberculous. It was treated by local removal, but microscopical examination showed carcinoma. The wound healed, but the patient returned six weeks later with recurrence, and the breast was then amputated. (i. 1680 and 1989.)

There was one other case of a woman, aged 64, in whom a local removal only was performed. (i. 2169.)

Local removal of recurrent Carcinoma was performed six times upon the breast alone, twice upon glands alone, and twice upon breast and glands. There were no deaths.

DUCT CARCINOMA.—In three cases the whole breast was removed with the glands; in the fourth a local removal only was performed, as the growth was thought to be fibro-adenomatous until it had been examined microscopically. (v. 2220.)

REMOVAL OF TUMOURS.

Cysts.

DERMOID.—In all five cases the tumour was in the neck. (Ovarian dermoids not included here.)

HYGROMA.—Two in the neck, one in the axilla.

Adenoma.

TONGUE.—A woman, aged 19, was admitted for a tumour at the root of the tongue. For fifteen years she had had some difficulty in articulation, and recently also in breathing. In the middle line of the tongue, just in front of the epiglottis, was a raised smooth elastic tumour, about an inch in diameter. The tongue was pulled well forward, and the growth removed by enucleation. It consisted of adenomatous tissue with a good deal of mucoid tissue, and microscopically the tumour showed some resemblance to thyroid tissue. The patient made a good recovery. (iv. 293.)

Fibroma.

BACK.—A girl, aged 9, was admitted with a smooth rounded tumour, deeply seated in the lumbar region beneath the erector spine muscle. It was removed, and proved to be attached to the lamina of a lumbar vertebra. Microscopically, it was found to consist of ill-formed fibrous tissue. It was apparently a congenital tumour. The child made a good recovery. (i. 1969.)

Bronchocele.—Five cases of INNOCENT BRONCHOCELE (adenomata or cystic adenomata) were treated by intra-glandular *enucleation*. All recovered. They were :—

A girl, aged 15, who had a cystic adenoma as large as a hen's egg ; it had been noticed five months ; there was no dyspnoea. (v. 2327.)

A woman, aged 22, with a cystic adenoma as large as a walnut, which had been noticed ten years ; about one-third of the tumour proved to be solid. (iv. 1028.)

A woman, aged 25, with a cystic adenoma, three-fourths of which proved to be solid. (iv. 1526.)

A woman, aged 25, with a cystic adenoma. (i. 1674.)

A woman, aged 32, with numerous small cysts and adenomata ; they were treated by multiple enucleation. (v. 1883.)

A boy, aged 13, with an encapsuled adenoma, which had existed six months, but had caused no symptoms, was treated by *extirpation* of the left lobe of the gland. He made a good recovery. (iii. 2645.)

Three patients with PARENCHYMATOUS GOITRE.

A woman, aged 29, was admitted with a bilateral goitre of five years' duration ; of late it had produced some dyspnoea and dysphagia. The right lobe was extirpated, the wound drained for one day, and the patient made an excellent recovery, leaving the hospital fifteen days after the operation. The goitre was parenchymatous, with a few small cysts. (iii. 1573.)

A woman, aged 21, with a similar goitre of three years' duration, which had caused some dyspnoea for one year, made a good recovery after a similar operation. (iv. 1701.)

A married woman, aged 35, had had a bilateral parenchymatous goitre for twenty-four years ; for one year she had had considerable dyspnoea. Six months ago she had been in the hospital for the same complaint, but on account of pregnancy it was thought best to treat her temporarily with iodine and thyroid extract, which diminished the dyspnoea and the size of the goitre. Recently she had had more dyspnoea. The right lobe was removed by extirpation, together with a prolongation from its lower horn, which passed down behind the sternum. The patient made an excellent recovery and left

the hospital on the nineteenth day after the operation, quite well, free from her dyspnoea, and with the wound soundly healed. (iv. 69.)

There were no operations during the year upon exophthalmic or malignant goitres.

Epithelioma.—**FLOOR OF MOUTH.**—A man, aged 65, made a good recovery after removal of the growth by an operation in which the lower jaw was divided and both linguals tied. (iii. 1361.)

FOREARM.—A man, aged 38, had for eleven years worked a coal tar machine, his duty obliging him to be constantly handling hot anthracene. For eighteen months he had had on both forearms numerous small raised red papules. In the last three months three of these had grown considerably, forming hard raised ulcerated masses about half an inch in diameter. These growths were removed by operation, and found to be typical squamous epitheliomata. The patient made a good recovery, but three weeks after leaving the hospital he returned with another similar growth on the forearm. This was removed in the Surgery, with a good result. The patient said that "a few years ago three of his mates doing the same work had died of growths, one on the forehead and two on the testicle" (? scrotum). A fourth workman had recently had a similar growth removed from the forearm. (iii. 1641.)

SCROTUM.—The only case was that of a chimney sweep, aged 70. (iv. 453.)

Rodent Ulcer.—A woman, aged 52, was admitted with a rodent ulcer of the chest wall of twelve years' duration; it was situated just below the clavicle, and measured five by two and a half inches. It was removed, and the wound covered in by an immediate plastic operation, with a good result. (v. 632.)

Sarcoma.—**BACK.**—A man, aged 35, was readmitted with a recurrent fibroid, which was removed. He underwent seven operations in eight years. (i. 3154A.)

TIBIA.—A servant, aged 23, was admitted with a small myeloid sarcoma of the head of the tibia. Three months previously she had first noticed pain and stiffness in the knee, followed two months later by a visible swelling. Over the inner tuberosity of the tibia was a slightly raised swelling, some two and a half inches in diameter, painless and tolerably well defined. It was thoroughly scraped away, and the patient made a good recovery, leaving the hospital on the sixty-fifth day after the operation with the wound soundly healed. (iii. 2647.)*

FOREARM.—A man, aged 48, was admitted with a large prominent soft myxosarcoma of a little more than two years' duration, springing from the fascia of the back of the wrist and lower part of the forearm. It was removed locally, with a good result. (ii. 3349.)

GLANDS.—A woman, aged 66, was admitted with a large mass of melanotic sarcoma in the glands of the left axilla; the disease was apparently secondary to a growth on the hand, which had first appeared twenty years previously, and had been removed three times, seventeen, fourteen and ten years ago, at another hospital, and had then been pronounced to be sarcomatous. (ii. 2236.)

MUSCLES.—A woman, aged 30, was admitted with a small recurrent sarcomatous growth in the thigh. Nine years previously a sarcoma had been removed together with most of the sartorius muscle; two years ago a small recurrent growth had also been removed. (iv. 2196.)

A primary sarcoma of the tibialis anticus was removed from a man, aged 40. (v. 3454.)

A remarkable case was that of a groom, aged 51, who was admitted for a tumour of the upper half of the left sterno-mastoid. It had been first noticed six months before, and had been growing steadily ever since. Four months ago an incision had been made into it at another hospital, but such profuse hæmorrhage occurred that the attempt to remove it was abandoned. (v. 1445.)

On admission the man's general health seemed good; in the region mentioned was a prominent soft rounded very elastic mass, as large as a cricket ball; the tumour was evidently extremely vascular, as its size could be very materially reduced by pressure. The skin over it was red and adherent. There were no enlarged glands, and no evidence of disease elsewhere could be found. The tumour was therefore removed, but the operation proved very severe, chiefly owing to venous hæmorrhage, and the patient died within an hour of its completion. The post-mortem showed another similar mass of growth of the same size in the left kidney, and there were numerous small secondary nodules in the heart, pleura and lungs. It was doubtful whether the tumour of the kidney or that of the sterno-mastoid was the primary growth, but probably the latter was. The tumour was a round-celled sarcoma. (v. 1445.)

NASAL SEPTUM.—A chair maker, aged 56, had had for eleven months obstruction in the nose, and for three months occasional epistaxis. The nose was opened freely, the upper jaw turned outwards, and the tumour, with a considerable portion of the septum, was removed. The tumour was a sarcoma. The patient recovered. (v. 2441.)

PERINEUM.—A clerk, aged 37, had had for eighteen months pain on sitting; for six months he had noticed a swelling which had gradually been increasing in size. On admission there was a deep-seated swelling on the right side of the perineum, apparently attached to the ischium. It was removed, and found to be a firm encapsuled tumour involving the crus and ischium; the bone was scraped; the patient recovered, but was readmitted three months later with recurrence unfit for further operation; he was then treated with Coley's fluid without any benefit. (v. 2107 and 3172.)

SYNOVIAL MEMBRANE.—The man whose case is recorded on p. 177 of last year's report was readmitted with further recurrence. Eventually amputation of the thigh was performed. (iv. 2758.)

OPERATIONS ON THE TONGUE.

Sixteen operations were performed for the removal of EPITHELIOMA, including five cases of mere local removal; in six of these cases the glands were removed at the same time.

There was one death.

EXCISION OF WHOLE TONGUE.—A labourer, aged 62, was admitted with an epithelioma of the floor of the mouth and under-surface of the tongue. It had been noticed about six weeks. An incision was made along the rami of the jaw from angle to angle, and the anterior three-fourths of the tongue removed. Some bone was also cut away from the back of the body of the lower jaw; the affected lymphatic glands on both sides were also removed. The patient made a good recovery, and left the hospital on the twenty-sixth day after the operation. He was completely relieved of his pain and much the better for the operation, but when seen again, a month later, recurrence of the disease had already occurred. (v. 376.)

A sailor, aged 58, was admitted with epithelioma of the floor of the mouth and under-surface of the tongue of ten months' duration. The tongue was somewhat fixed, and glands were affected on both sides. A V-shaped incision was made beneath the chin, and the anterior three-fourths of the tongue

removed. Recurrent hæmorrhage an hour after the operation necessitated re-opening of the wound. The patient did fairly well for about three days, then he began to go downhill, and he died on the ninth day after the operation. The temperature after the operation was generally about 100°; there was much trouble in feeding, and the discharge from the wound was somewhat foul. There were no definite signs of pneumonia. There was no post-mortem. (v. 169.)

EXCISION OF ONE LATERAL HALF, together with the glands, was performed five times upon male patients, aged 44, 52, 55, 50 and 52 (iii. 1834, 2789, 3208 iv. 2552, v. 2562). All made good recoveries.

Without removal of glands, an otherwise similar operation, was performed upon four male patients, aged 46, 60, 60 and 77 (i. 2351, ii. 2131, v. 2954 and iv. 33.)

All these recovered from the operation and left the hospital; in the last case, however, the disease involved also the floor of the mouth, and within a few weeks the patient was readmitted with recurrence, for which no further operation was undertaken.

LOCAL REMOVAL of epithelioma was performed upon four men, aged 56, 59, 67 and 58 (one of these was in twice), with good results. (ii. 591, 2102 and 2482, iv. 1392, 2319.) One of these patients (ii. 2482) was subsequently readmitted, and underwent partial removal of the jaw. (*q.v.*, ii. 3014.)

OPERATIONS ON BURSÆ, FASCIÆ AND TENDONS.

There was one death among the fifty-four operations of this class.

Ganglion.

A laundress, aged 23, was admitted with a very large compound ganglion of the palm and forearm of two years' duration. Two operations for its removal were performed; the synovial membrane was very thick and tuberculous, and there was much serous fluid and pus. Both wounds healed well, the temperature remained normal, and the patient was convalescent when, on the thirty-second day after the second operation, symptoms of tuberculous meningitis set in, and the patient died of this twelve days later. The post-mortem showed also tubercle of the lungs, liver, spleen and kidneys. (iii. 2859*.)

OPERATIONS ON THE NOSE.

There was no death or any complication after any of the thirteen operations of this class.

OPERATIONS ON THE LARYNX AND TRACHEA

Tracheotomy.

The forty-six cases of tracheotomy of DIPHTHERIA were all in the Medical Wards, and consequently do not appear in Table I.

FOR DYSPNŒA AFTER FRACTURE OF THE SKULL.—A boy, aged 7, had fallen off a wall, and was admitted with a fractured base. He vomited, and then ceased to breathe. Tracheotomy was performed, but the patient never breathed again spontaneously. (iii. 562.)

FOR EPITHELIOMA.—A hair-dresser was admitted for epithelioma of the PHARYNX of four months' duration. Tracheotomy was performed for dyspnœa on the twelfth day, but he died seventeen days later. The post-mortem showed an extensive epithelioma involving also the larynx. (iv. 1119.)

The potman, aged 44, mentioned on p. 109 of last year's report was readmitted, and tracheotomy was performed a month later. The disease of the LARYNX had lasted two years, and there was extensive affection of the glands of the neck. He gradually sank, and died seventy-eight days after the operation. (v. 125.)

For FIBROMA OF PHARYNX.—A fitter, aged 54, was admitted for dysphagia and dyspnoea of nine months' duration. The latter symptom had lately become very severe, and he had occasionally brought up a little blood. On admission the patient, although rather thin, was in fairly good health. He was quite unable to swallow any solid food, and could swallow liquids only with great difficulty, regurgitating in a few minutes most of what he had tried to drink. The voice was thick and husky, but when he was quiet there was but little actual dyspnoea. The laryngoscope showed a rounded ulcerated mass overlapping and completely concealing the interior of the larynx, and apparently springing from it. The growth was believed to be a tumour of the larynx, and it was arranged that an exploratory thyrotomy should be performed, with the view of removing the tumour if possible. On the morning of the day fixed for the operation, seven days after admission, a sudden and violent attack of dyspnoea, culminating in complete cessation of respiration, required a hurried tracheotomy and artificial respiration. Later in the day, as the anæsthetic (chloroform) was being administered through the tracheotomy tube preparatory to the thyrotomy, and before the operation had begun, breathing again ceased, and this time, in spite of the usual efforts at restoration, the patient did not recover. The post-mortem showed a rounded fibrous tumour, measuring 35 by 27 by 20 mm. in diameter, and attached by a narrow pedicle, 15 mm. in length, to the posterior wall of the pharynx in the middle line and just opposite the upper part of the larynx. The tumour had lain usually partly over and partly in the larynx, but could be displaced from this position into the pharynx. (v. 2478.)

For FRACTURE OF LARYNX.—A boy, aged 7, was run over by a cart. On admission, shortly afterwards, there was much dyspnoea, and the voice was husky. Surgical emphysema rapidly set in on both sides of the neck, and thence extended all over the body. Tracheotomy afforded only temporary relief, and the patient died twelve hours after the accident. The larynx and trachea were believed to have been fractured. There was no post-mortem. (iii. 1472.)

For LARYNGITIS.—A female infant, aged 10 months, died after a tracheotomy for laryngitis following measles. (Medical Register, Vol. I., No. 86.)

For LYMPHO-SARCOMA OF THE NECK.—A girl, aged 16, had had lympho-sarcoma of the glands of the neck for three months. One vocal cord was paralysed. Tracheotomy was performed for dyspnoea; the patient was relieved, but died of the disease six weeks later. The post-mortem showed extensive masses of growth in the mediastinum. (ii. 560.)

For SARCOMA OF THE LARYNX.—A railway porter, aged 48, was knocked down by an engine, and admitted with a crushed foot and a simple fracture of the humerus. Primary amputation of the toes was performed; the wound did not do well at first, and the arm took a long time to unite. Two months after admission the patient began to cough up pieces of flesh-like material, which were found to be sarcomatous when examined microscopically on several occasions. A fungating mass was seen in the larynx; this increased steadily in size, and tracheotomy became necessary. The patient gradually became weaker and thinner, and eventually left the hospital five months after admission, and died a fortnight later. (v. 3013*.)

For SARCOMA OF THYROID GLAND.—A costermonger, aged 31, was admitted on account of a swelling in the neck. He had never had any swelling in this region until about two months before admission, when he had first noticed dysphagia, soon followed by dyspnoea, and afterwards by dysphonia.

On admission there was at the root of the neck, and extending upwards for an inch and a half, a symmetrical fixed mass, of dense almost stony hardness, on both sides of, and in front of, the trachea. The larynx did not move on deglutition; the right vocal cord was paralysed; there was much stridor. The exact origin of the growth was considered doubtful, some thinking it to be epithelioma of the œsophagus, others sarcoma of the thyroid gland or neighbouring parts. The patient grew rapidly worse, and the attacks of dyspnoea became so bad that on the twenty-sixth day after admission, tracheotomy was performed through the thyroid isthmus. The trachea was greatly narrowed, and the operation was very difficult. A long tracheotomy tube had to be inserted. The dyspnoea was never completely relieved, and the man died three days after operation. The post-mortem showed no disease of the œsophagus, but a firm homogeneous sarcomatous growth surrounding and infiltrating the large vessels at the root of the neck. Both lobes of the thyroid gland were infiltrated, but the main mass was situated below them. There were a few small secondary nodules in the lungs, but no secondary growths in any other part of the body. The exact origin of this tumour was considered doubtful; it probably originated in the left inferior horn of the thyroid gland. (v. 81.)

For SCALD OF THE LARYNX.—Two girls, both aged 2, made good recoveries after tracheotomies done six and four hours after the accident. (ii. 255, v. 954.)

For POST-PHARYNGEAL ABSCESS.—A boy, aged 17 months, was admitted (at first to a medical ward) with discharge from both ears, a sore throat and dyspnoea. The case was thought at first to be one of diphtheria, and tracheotomy was performed. Subsequently, a post-pharyngeal abscess was found to be the cause of the dyspnoea, and it was opened; the child recovered. (v. 1678.)

Thyrotomy.

For STENOSIS OF THE LARYNX.—A soldier, aged 28, had been discharged from the army two years previously on account of ulceration of his larynx said to have followed typhoid fever. A year later a blow on the larynx, necessitated tracheotomy. Thyrotomy was subsequently performed at another hospital, the thyroid cartilage being sutured with silver wires, two of which were subsequently coughed up. On admission there was considerable suppuration about the larynx and a cavity in one lung. A sinus was opened up, and subsequently thyrotomy again performed, a wire suture being removed and the whole interior of the larynx scraped out. The patient's voice was for a time much improved, and he was enabled to dispense with the tracheotomy tube. But when he left the hospital, twenty-four days later, the larynx was beginning to contract up again. Three days after he had left, the tube had to be reinserted. (v. 1546.)

OPERATIONS ON NERVES.

There was no death or other serious complication after any of the thirteen operations of this class.

Nerve stretching.

A highly neurotic man, aged 20, was admitted with spasmodic wry neck. The spinal accessory nerve was stretched, and subsequently some of the posterior cervical nerves, but neither operation led to any improvement in the patient's condition. (i. 3125.)

OPERATIONS ON THE VASCULAR SYSTEM.

Ligature of arteries for aneurism.

BRACHIAL, RADICAL AND ULNAR.—These arteries were all tied simultaneously at the bend of the elbow for an arterio venous aneurism in a stoker

aged 28. One month previously he had been wounded by a sharp piece of iron. At the operation a small piece of iron was removed. The patient made an excellent recovery. (iii. 1951.)

COMMON CAROTID.—A female singer, aged 32, had had a blow on the side of the head eight weeks before admission. Three days later a soft swelling was first noticed behind the angle of the jaw; two weeks later it was noticed to throb. On admission there was on the left side of the neck, opposite the hyoid bone, an aneurism about as large as a walnut, pulsating strongly. The patient left the hospital on the twenty-fifth day after ligature of the common carotid, the aneurism being quite cured. (iv. 502.)

Carotid and Subclavian.

A fishmonger, aged 39, who had had for four months cough and pain in the back and chest, and for one month a visible swelling, was admitted to a medical ward with an intra-thoracic aneurism, probably aortic, possibly innominate. There was an external swelling as large as half an orange, with much pulsation; there was much erosion of the manubrium sterni. For seven months he was treated strictly by Tuffnell's method, and on three occasions by needling. The aneurism diminished considerably in size and pulsation, but then remained stationary, without being cured. The patient was then transferred to a surgical ward, and simultaneous ligature of the right common carotid and subclavian. No cerebral symptoms or dyspnoea or any other bad result followed the operation; the wounds healed immediately. The aneurism at first diminished in size, then increased again, so that a month after the operation it was still large; after this, however, it again contracted and became much firmer. The patient left the hospital six weeks after the operation, and when seen again three months later, was in excellent health. The aneurism could still be felt pulsating, but the pulsation was probably merely transmitted. (v. 3240*, also v. 2368 and 2691.)

Extirpation of traumatic aneurism.

POST-TIBIAL. TEMPORAL.—A boy, aged 1 year and 10 months, and a man, aged 27, with small traumatic aneurism of the posterior tibial (after tenotomy) and temporal arteries respectively, were cured by removal of the aneurism. (i. 2036 and 1105.)

Ligature or excision of varicose veins was performed in fifty-three cases, with uniformly good results.

Transfusion was performed upon two men, aged 24 and 23, after a primary amputation of the arm, and for recurrent hæmorrhage after a radical operation for hernia. Both recovered. (iv. 1976 and v. 697.)

OPERATIONS ON THE GENITO-URINARY ORGANS.

Circumcision.

An unusual case was that of a boy, aged 3, who was admitted with paraphimosis and extravasation of urine. He had been quite well until three days before admission, when the prepuce became swollen and retracted, and there was much difficulty in passing water. On admission the scrotum was swollen to the size of cricket ball, and was tense and painful. Incisions were made into the scrotum and a urinary abscess above the pubes was opened; circumcision was also performed, and the child made a good recovery. No calculus or stricture or any other cause of the extravasation could be found except paraphimosis. (v. 2504.)

Nephrotomy was performed four times for pyo-nephrosis (including tubercle), twice for hydro-nephrosis, once for renal fistula, and seven times as an exploratory operation in cases of sarcoma of kidney, sarcoma of mesentery, calculus in the ureter, hæmaturia, and renal pain (three cases). There were two deaths.

For PYO-NEPHROSIS.—A woman, aged 41, had had for seventeen months pain in the loin, and for thirteen months a renal swelling which varied considerably in size at different times. A lumbar operation gave exit to much pus, but no stone was found. She left the hospital two months later with a sinus, which healed soon afterwards (iii, 296). A few months later she was readmitted with a sarcoma of the femur. (See p. 120, iii, 2157.)

A woman, aged 37, was admitted very ill with an enlarged right kidney, thought to be tuberculous. A swelling had been noticed in this region for six years. Tubercle bacilli were found in the urine. Lumbar nephrotomy was performed, about three ounces of pus being let out. After the operation the patient passed no water per urethram, although some ran from the wound. She gradually became more and more drowsy, and died on the thirteenth day after the operation. The post-mortem showed that the left kidney had been wholly destroyed by old tubercle, and that the right kidney was the seat of both old and recent tubercle; there was also tubercle in the lungs. (v. 746.)

A girl, aged 14, had suffered for at least three years with frequent micturition, pyuria and hæmaturia. An incision was made down to the enlarged right kidney, and much pus let out. Examinations of the pus from the kidney never showed any tubercle bacilli. The patient improved somewhat, but there was still a copious discharge of pus from the wound when she left the hospital, three months after the operation. A few weeks later she was readmitted and the kidney removed, and found to be tuberculous. (v. 350 and 1807.)

The case of a woman, aged 22, who underwent both exploratory laparotomy and nephrotomy is described under the former (p. 241). (v. 2960*.)

For HYDRO-NEPHROSIS.—A woman, aged 45, had been suddenly seized two and half years previously with pain in the right hypochondrium, and a swelling soon afterwards appeared here. Numerous similar attacks occurred afterwards. On admission a moveable rounded tumour could be felt in the above situation. There were no urinary symptoms. The tumour was thought to be an enlarged gall bladder, so the abdomen was opened in front of it. It was found to be a kidney, and was then opened from the loin and several ounces of clear urinous fluid were let out. The kidney was drained, and the patient left the hospital twenty-three days later, quite well, and with the wound soundly healed. (v. 1072.)

A woman, aged 31, was admitted for severe pain and a renal swelling which had been noticed four days. On the seventh day after admission an incision was made through the loin, and much clear urine evacuated. The patient made a good recovery, and left the hospital on the fifty-third day after the operation with a sinus in the loin. (i. 724.)

For RENAL FISTULA.—The man, aged 35, whose case is described under rupture of the kidney (iii, 1916, page 138), was readmitted three months later on account of a fistula in the loin. Nephrotomy was performed, with a good result. (iii, 2975.)

For SARCOMA OF KIDNEY.—A tobacco weaver, aged 52, was transferred from a medical ward with the history that he had been unwell for a year, and that for six weeks he had had pain in the loin, vomiting, headache and rapid emaciation. There was no history of hæmaturia. There was a considerable renal tumour, and the urine contained a little pus, but no blood. A month after admission, the diagnosis between malignant disease and pyo-nephrosis being uncertain, lumbar nephrotomy was performed and about a pint of turbid

urine withdrawn from the pelvis of the kidney. An infiltrated gland that was removed proved to be malignant. The kidney was drained, as removal seemed out of the question; but the wound never healed, and the patient gradually grew worse until he was finally discharged to an infirmary fifty-eight days after the operation. (v. 343.)

For SARCOMA OF MESENTERY.—A housekeeper, aged 43, was admitted with a large smooth swelling in the region of the left kidney, of eighteen months' duration. The urine contained a little pus. Shortly after admission it became much smaller, and was thought to be a hydro-nephrosis. An exploratory lumbar incision showed a healthy kidney, unconnected with the tumour. An abdominal section showed a soft mass of irremovable malignant disease of the mesentery involving the intestines. The patient recovered from the operations and left the hospital. (iii. 2851*.)

For CALCULUS IN URETER.—This case is described under exploratory abdominal section, which was also performed. (v. 423.)

For HÆMATURIA.—An ironworker, aged 38, was admitted for hæmaturia, which had occurred frequently since an injury to the loin six months previously. An exploratory nephrotomy revealed nothing abnormal. The patient recovered and left the hospital. (v. 1419.)

For RENAL PAIN.—A labourer, aged 33, had had in twelve months several severe attacks of right renal colic, but no hæmaturia. The urine was acid and contained pus; there was some tenderness, but no tumour in the loin. The kidney was exposed in the loin and the pelvis opened and explored thoroughly. No stone or other disease could be found. The patient recovered from the operation, but the temperature remained a little above normal, and he left the hospital twenty-five days after the operation with the wound nearly healed. (iii. 1450.)

A woman, aged 32, had had pain in the loin sixteen months previously; she had then passed some "gravel" and a small calculus; since that time there had been many attacks of pain. She had never had hæmaturia. An exploratory nephrotomy showed no stone; the kidney seemed healthy. A good recovery followed, and the patient lost all her pain. (iii. 2829*.)

A woman, aged 32, had had for six months attacks of renal colic with hæmaturia and oxaluria. No tumour could be felt. An incision through the loin down to the kidney revealed neither stone nor any other disease. There was much hæmorrhage, and the wound had to be plugged. The patient made a good recovery, and left the hospital twenty-four days after the operation. (v. 1638.)

Nephrectomy (abdominal) was performed three times, for pyo-nephrosis with calculus, for hydro-nephrosis with calculus, and for sarcoma, respectively. One patient died.

For PYO-NEPHROSIS.—A male cook, aged 55, had had for three months left lumbar pain, pyuria and hæmaturia, and had lost much flesh. There was no history of any previous urinary trouble. In the left loin was a swelling as big as two fists. Abdominal nephrectomy was performed through the left linea semi-lunaris, and the kidney removed from within the capsule; the latter was greatly thickened and very adherent. There was much hæmorrhage. The wound was drained through the loin. The patient was greatly collapsed, and died in twelve hours. The kidney was found to contain numerous small calculi and much pus. The ureter was also much thickened. (iii. 2175.)

For HYDRO-NEPHROSIS.—A girl, aged 16, was admitted for pyuria and hæmaturia of three months' duration; there was some resistance and tenderness in one loin. The abdomen was opened in the linea semi-lunaris, and a much dilated kidney removed. When laid open it was found to be

a hydro-nephrosis, with a calculus as large as a hazel nut impacted in the ureter. The renal tissue had been almost completely destroyed by long-continued pressure. The patient made an uninterrupted recovery, and left the hospital on the twenty-sixth day after the operation. (ii. 1053.)

For SARCOMA.—A girl, aged 15, had had for twelve months a swelling in the loin, and for six months some pain and emaciation. The kidney was removed by abdominal section; it was very large, occupying most of the left side of the abdomen; it was much fixed. After removal it was found to weigh eight pounds. The patient made a good recovery, and left the hospital on the thirty-eighth day after the operation. (i. 1759.)

Nephrectomy (lumbar) was performed once for tuberculous pyo-nephrosis.

For PYO-NEPHROSIS.—A girl, aged 14, was admitted with amyloid disease and a sinus in the loin leading to the kidney. She had been in the hospital six months previously, and an abscess connected with the kidney had been opened and drained. For several years she had had pyuria and hæmaturia. The kidney was removed by lumbar nephrectomy and was found to be considerably enlarged and full of pus. There was scarcely any renal tissue left. It was evidently an old tuberculous kidney. The wound was packed with gauze, and the patient made a rapid and excellent recovery, leaving the hospital on the thirty-sixth day after the operation. The enlarged liver had then returned nearly to its normal size. (v. 1807.)

Nephro-lithotomy was performed three times, with no deaths.

A woman, aged 32, had had for nine months pain in the loin, and for six weeks hæmaturia and more pain. There was a large swelling in the left loin. The kidney was opened and drained and part of a large branched stone was removed. She improved considerably, and the suppuration became much less. She was discharged sixty-four days after the operation, to return for subsequent nephrectomy if necessary. (v. 1177.)

A woman, aged 55, had had for ten years symptoms of renal calculus. A large stone was removed. A mild attack of parotitis set in on the twelfth day, but the patient made a good recovery. There was no suppuration. The patient left the hospital thirty-nine days after the operation, with the wound healed. (iii. 271.)

A paper stainer, aged 63, had had pain in the right loin for fourteen years on and off. In the last four years the pain had been very severe. He had once passed a small stone, but there was no history of hæmaturia. The kidney was exposed from the loin and a stone felt. A free incision was then made into the kidney substance and a stone as large as a cherry removed. The wound was partly closed by sutures (one through the kidney) and drained. For several days patient did well, although the urine contained a good deal of blood. From the eighth to the twentieth days, however, many severe attacks of secondary hæmorrhage occurred, both from the wound and through the urethra; the wound was firmly plugged. The patient became so blanched and so ill that the propriety of removing the kidney was then discussed. The operation was, however, not performed, for from that time gradual improvement took place; the hæmorrhage ceased, and the patient made a slow but good recovery, leaving the hospital on the fiftieth day after the operation in good health, but with a sinus in the loin. (iii. 1765.)

Nephrorraphy was performed four times.

A woman, aged 23, had been in the hospital ten weeks previously (in 1896) for renal pain; an abscess had been opened, with much relief. She was readmitted with fresh pain in the same loin. The kidney was explored through a

lumbar incision, the pelvis opened, and a catheter passed down the ureter. Nothing abnormal was found, except that the kidney seemed rather loosely attached to the surrounding parts. Nephrorraphy was consequently performed. The patient made an excellent recovery, leaving the hospital on the thirty-first day after the operation with the wound soundly healed. (iii. 2776*.)

The other three patients were women, aged 45, 39 and 39 ; all made good recoveries. (i. 1147, iii. 495 and 2057.)

Lithotrity was performed five times, with one death.

Three male patients, aged 11, 20 and 50, had had symptoms of stone for three months, one year and three years respectively. A fourth man was aged 70. All made good recoveries. (iii. 3356, iv. 3594*, i. 3124, ii. 1011.)

A coachman, aged 52, was admitted with the ordinary symptoms of vesical calculus. Lithotrity was performed by Bigelow's method. The evacuator was used rather energetically by one of the assistants, and towards the end of the operation it was noticed that the water did not return freely from the bladder. The stone was rather large, and appeared to lie in a recess in the bladder. After the operation the patient passed no urine, and it was found that water injected into the bladder did not return. The abdomen was opened thirty hours after the operation, and a rent was found in the bladder and sewn up. The patient died collapsed about twelve hours later. Subsequent examination showed a rent in the trigone (apparently there had been a pouch there), much separation of the bladder from the rectum, and a rent one and a quarter inches long in the peritoneum at the bottom of the right side of the recto-vesical pouch. There were several fragments of stone here ; the suturing of the hole in the bladder was not very perfect. (v. 1326.)

Lithotomy (perineal) was performed once.

A man, aged 20, had in the last three years passed small stones per urethram on eight different occasions. In the last three months he had had occasional attacks of pain in the back and retention of urine. In the last of these he came to the hospital ; his bladder was found fully distended, and a stone could be felt impacted far back in the urethra. This was crushed with urethral forceps and removed ; at the same time another stone was felt in the bladder. A month later median perineal lithotomy was performed and three stones removed, the largest of the size of a walnut. The operation was followed by acute epididymitis. Five weeks later another calculus became impacted in the urethra, and was removed by external urethrotomy. After this the patient made a good recovery, and left the hospital three months after admission. There was some incontinence of urine when he was last seen some weeks later. (ii. 1079.)

Lithotomy (supra-pubic) was performed five times, with one death.

A boy, aged 2, with a history of symptoms for two weeks ; a uric acid stone, weighing sixteen grains, was removed ; an attack of diphtheria followed, but the patient made a good recovery. (iv. 3821*.)

A watchmaker, aged 60, made a good recovery after removal of a large uric acid stone ; the symptoms had lasted about five years. (v. 3040.)

A hawker, aged 25, had had symptoms for ten years ; a large mulberry calculus, about two inches in diameter, was removed, and the patient made a good recovery, leaving the hospital on the thirty-eighth day after the operation with the wound healed. (iii. 2359.)

A man, aged 61, had had pain and hæmaturia for three years ; a small stone was removed, and some hardness was felt at the base of the bladder, which was thought to be malignant disease ; the patient made a good recovery. (v. 2479.)

A farmer, aged 76, had three stones as large as hazel nuts removed by supra-pubic operation; the wound was drained. The temperature remained normal, but the patient passed into a state of senile dementia, and died on the sixteenth day. The post-mortem showed much interstitial nephritis; the wound looked well. (iv. 1234.)

Cystotomy (perineal) was performed once.

A man, aged 44, was admitted with retention of urine; he said at first that he had been in good health until a few hours previously, when retention occurred, and a little blood was noticed to be trickling away from him. He admitted, however, that for six months he had occasionally had trouble with his urine. The water when drawn off was found to contain much blood, and to be very foul. The bladder was washed out frequently, but the patient grew worse; rigors occurred, and on the seventh day a median perineal cystotomy was performed to drain the bladder; a foul perineal abscess was opened in the course of the operation. The patient died next day. The post-mortem showed both kidneys to be dilated to the size of a foetal head, and in a state of acute suppuration; both ureters were dilated to the size of a forefinger. The bladder showed acute cystitis, and around it there was localised recent peritonitis. There was a stricture of the bulb of the urethra and much foul suppuration about the perineum. (ii. 3313.)

Cystotomy (supra-pubic) was performed seven times for malignant tumour, with three deaths; three times for innocent villous tumour, with no death; twice for enlarged prostate, with no death; and twice for suspected tumour and suspected stone, with one death.

For CARCINOMA.—A married woman, aged 41, was admitted with a large carcinomatous tumour of the bladder. Four months previously she had first noticed turbidity of the urine and pain on sitting down. Two months later dysuria and hæmaturia set in, and in the last few weeks she had been quite unable to hold her water. Five days after admission the bladder was opened above the pubes, and the growth removed with scissors. It was as large as an orange, its circumference being eleven inches. It was attached by a broad pedicle to the posterior and lateral part of the bladder. Its surface was foul and ulcerated, and microscopic examination showed it to be carcinomatous. The bladder was drained and frequently washed out with 1 in 6,000 biniodide of mercury lotion. After the first few days of depression the patient made a good recovery, and was much relieved by the operation. She left the hospital on the sixty-eighth day, fairly comfortable and able to get about. She was reported to have died at home thirty-two days later. (v. 969.)

A woman, aged 59, had had pain and hæmaturia for ten months. With the cystoscope a villous growth was seen near the ureter. The growth was removed by supra-pubic cystotomy, and was found to infiltrate the wall of the bladder to a slight extent. It was quite small, and looked like an innocent papilloma, but microscopically it was found to be carcinoma. The wound healed, and the patient left the hospital on the thirty-second day after the operation. Nine months later she returned with extensive recurrence, unfit for further operation (see Appendix I, p. 117). (iii. 468 and 2498.)

A labourer, aged 32, had had for four months hæmaturia and occasional pain in the loin, but no other symptoms. The bladder was opened and a pedunculated growth found attached to the right side of the fundus. It was removed with a scoop, and found microscopically to be carcinomatous. The patient recovered, and left the hospital fifty-nine days after the operation; the wound had not quite healed. (ii. 171.)

A labourer, aged 54, had had for six months frequent micturition and hæmaturia. At the operation an extensive irremovable carcinomatous growth was found near the trigone. The patient left the hospital twenty-three days later with the wound healed. (i. 1681.)

A dock labourer, aged 33, had suffered for three months from hæmaturia and dysuria; a few days before admission he passed a small calculus. Per rectum a hard mass could be felt at the base of the bladder, which was believed to be malignant. No stone could be felt on sounding. He was a strong healthy-looking man, but in much distress. The bladder was opened above the pubes, and the growth, which was a carcinoma measuring two inches across and half an inch in thickness, was removed, chiefly with scissors; it sprang from the neighbourhood of the left ureter, a portion of which was removed with it. The peritoneal cavity was freely opened during the operation, and sewn up again after the removal of the tumour. The bladder and peritoneal cavity were both drained. The patient died two days later of shock and uræmia. The post-mortem showed that the growth had not been completely removed from the bladder, and that there were also numerous secondary growths in the lumbar glands and liver; the opening between the bladder and peritoneum had not been completely closed. (ii. 2952.)

A man, aged 53, was admitted for hæmaturia, which had begun painlessly three months previously. Six weeks later he began to have dysuria and pain. On admission the prostate was found large and very hard; the urine was alkaline, and contained much blood. The bladder was opened above the pubes, and a large hard mass of carcinoma found in the region of the trigone, and above it. It was clearly irremovable. The bladder was sewn up, but a drainage tube was put in the lower part of the superficial wound. No catheter was tied in. The house surgeon unfortunately omitted to pass a catheter frequently as directed. Three hours after the operation the patient, who was in much pain, attempted to pass water, and passed a little by the urethra and a good deal through the wound. When a few hours later a catheter was passed and tied in, only a very little urine was drawn off. Next day the patient was still in much pain, but otherwise seemed better. He died rather suddenly about twenty-five hours after the operation, and twenty days after admission. There was no post-mortem. (i. 2573.)

A confectioner, aged 62, had had intermittent profuse hæmaturia for twelve months, worse lately. Sounding caused much hæmorrhage. The bladder was opened above the pubes, and a large carcinomatous growth found in the region of the trigone; it was clearly irremovable. The bladder was drained. The patient gradually sank, and died a fortnight after admission. There was no post-mortem. (iv. 1355.)

For INNOCENT VILLOUS TUMOUR.—A bookbinder, aged 44, who had had symptoms of villous tumour for nearly ten years, and who had undergone operations for its removal in 1892, 1894 and 1896, was readmitted. Supra-pubic cystotomy was again performed, and more growth removed by twisting it off with forceps; the forceps were left on for several weeks. The bladder contained much growth. The patient recovered. (i. 546.)

A schoolmaster, aged 33, who had had similar symptoms for many years, and who had been operated on seventeen months ago (see last year's report, p. 187), was readmitted. The bladder was again opened, and more growth removed on eight separate occasions. He left the hospital three months after admission. (v. 2042.)

A stick-mounter, aged 40, had had for three years frequent hæmaturia, and lately some pain. With the cystoscope a growth was seen; the bladder was opened above the pubes, and a villous papilloma, three-quarters of an inch long, was removed with a galvanic éraseur from the neighbourhood of the trigone. The bladder was sewn up without drainage, and the patient made a good recovery, leaving the hospital on the forty-sixth day after the operation. (i. 2279.)

For ENLARGED PROSTATE.—A shopkeeper, aged 66, had had for nine years frequent micturition and occasional hæmaturia. A year ago supra-pubic cystotomy and removal of part of the prostate had been performed in the

hospital. (See 1896 report, p. 186.) As he was still suffering from cystitis, the bladder was reopened above the pubes and drained. The patient made a good recovery, and left the hospital on the thirtieth day after the operation, much relieved, but still wearing a tube in the bladder. (v. 1448.)

A brickmaker, aged 47, was admitted for enlargement of the prostate. For about five years he had had trouble with his water, much worse in the last month, during which he had had frequent retention and occasional hæmaturia. With the cystoscope a prominent fold of mucous membrane could be seen in the region of the trigone. On the fourteenth day after admission the bladder was opened above the pubes, and a sacculæ was found just above the trigone. The margin of the fold above mentioned was divided. No other disease was found. The bladder was drained by the urethra and by the wound. A good deal of cystitis continued for some weeks. The patient eventually left the hospital on the seventy-second day after the operation, the wound being almost healed. (ii. 3211*.)

For SUSPECTED TUMOUR.—A caretaker, aged 36, had complained for five years of a dull, dragging pain across the loins. Two years ago he had had a first attack of hæmaturia, lasting three weeks; at the same time he had a good deal of abdominal pain and vomiting. Recently he had had much more hæmaturia, passing blood in clots. He was admitted very anæmic, complaining of pain in the penis and passing much blood. Examination with sound and cystoscope, and with a finger in the rectum, were all thought to indicate a tumour in the bladder. The bladder was opened above the pubes, but no growth was found, only some congestion of the mucous membrane. The wound in the bladder and in the abdominal wall were both sewn up without drainage. The temperature immediately rose to 101·2°, and remained at this level for three days, then became nearly normal. On the day after the operation he complained of much pain about the bladder. For the first twenty-four hours the water was drawn off; he was then allowed to pass it naturally. On the seventeenth day after the operation he was sitting up and seemed nearly well. There was no hæmaturia, and the wound had apparently closed. But two days later the scar suddenly gave way and urine escaped freely through the wound. A large cavity was then found behind the pubes. From this time the patient gradually went down-hill; he passed nearly all his urine through the wound, which gradually gaped more and more. Eventually he died of exhaustion on the fiftieth day after the operation. The post-mortem showed extensive pelvic cellulitis and urinary extravasation. There was no disease of the bladder, but in one of the lowest calices of the right kidney was a small rough stone, which had been the cause of the hæmaturia. There was no distension of the kidney. (i. 2197.)

For SUSPECTED STONE.—A man, aged 24, was admitted for pain in the right loin and symptoms pointing vaguely to stone in the bladder. The cystoscope showed ulceration round the right ureter. The bladder was sounded, and it was thought that a stone was felt and heard (subsequently it was found that the sound heard was caused by a faulty instrument). The bladder was opened above the pubes, but no stone was found. The bladder was drained for sixteen days. The patient made a good recovery, and left the hospital six weeks after admission. (iii. 809.)

Castration.—For HÆMATOCELE.—A builder, aged 49, had had a hæmatocele for eighteen years; for fifteen years on and off it had been suppurating. There was a very thick-walled hæmatocele with sinuses about it. It was completely removed, together with the atrophied testis. A good recovery followed. (iv. 2158.)

For MALIGNANT DISEASE.—Performed with relief upon two patients, aged 27 and 34, with disease of four and eight months' duration. (i. 2451 and v. 3028A.)

Also with a fatal result upon a man, aged 76, whose case is described under exploratory abdominal section for malignant disease, which was also performed upon him. (v. 836.)

For **RETAINED TESTIS**.—Performed three times upon patients, aged 21, 28 and 16. (iii. 2790, 362 and v. 540.)

For **TUBERCULOUS TESTIS**.—Performed three times upon patients, aged 24, 24 and 31. (iv. 485, 2154 and v. 1106.)

Transplantation of retained testis.—Performed four times upon patients, aged 8, 14, 6 and 7. (ii. 871, 2164, v. 2729, 3309.)

Ligature of varicocele.—Performed twenty-eight times by the open, and seventeen times by the subcutaneous method; in three cases the open operation was followed by considerable orchitis or sloughing of the testis. (iii. 645, 2896, v. 3019*.) In one case the subcutaneous operation was unsuccessful, and was followed by an open operation. (ii. 2858.) In one case both operations were performed, one on each side. (i. 1931.)

Excision of the sac of a hydrocele was performed seventeen times with uniform success.

Excision of the sac of a hydrocele of the cord was also performed four times with success.

Excision of the sac of a hæmatocele was successfully performed seven times (not including the case described under castration).

Excision of vas deferens.—Performed once with a fatal result. A basketmaker, aged 67, had suffered for ten years from the usual symptoms of enlargement of the prostate, and had had many attacks of retention. On admission the urine was alkaline, and there was about four ounces of residual urine. He was treated by catheterisation and washing out, but he went steadily down-hill. Three weeks after admission a portion of each vas deferens was resected. His condition, however, did not improve; after the operation he was a little demented, but his mental condition before the operation had not been quite sound. He gradually sank and died seven days after the operation. The post-mortem showed much cystitis and pyelo-nephritis, and a uniform symmetrical enlargement of the prostate. (iii. 978.)

Internal urethrotomy was performed nine times; in one case the operation was followed by considerable hæmorrhage, lasting for some hours. (v. 823.) In another case both internal and external urethrotomy was performed simultaneously upon separate strictures. (iv. 1254.)

External urethrotomy was performed twice for calculus in the urethra, once for rupture of the urethra, and five times for stricture.

For **CALCULUS**.—A collier, aged 35, had five years previously sustained a severe crush of the pelvis from a fall of coal. Necrosis of the pelvis had followed, and operations for the removal of pieces of bone and of calculi from the bladder had been performed elsewhere. A urethral fistula and a stricture also followed, and for these he was admitted. Perineal section was performed, and a stone removed from a pouch near the prostatic urethra. Later a piece of bone was removed from the bladder. The patient was much improved, and left the hospital two months after admission, able to pass water comfortably. (i. 2142.) The other case has already been described under Perineal lithotomy, which was also performed. (ii. 1079, p. 202.)

For RUPTURE OF URETHRA.—A boy, aged 11; the ruptured ends were sutured, a catheter was kept in for twenty-five days, and an excellent recovery ensued. (iii. 3176.)

For STRICTURE.—Performed four times with good results upon men, aged 38, 52, 30 and 38. (iii. 6, iv. 227, 1254, v. 1635.)

OPERATIONS ON THE RECTUM AND ANUS.

Among eighty operations of this class, there was one death, after the incision of a fistula (see below); there was no serious complication in any other case.

Incision of fistula.—A clerk, aged 27, was admitted with phthisis, a fistula in ano, and a large abscess in the lower part of the abdominal wall. The fistula was incised and the abscess opened, a piece of fish bone being removed from the latter. Suppuration continued, diarrhoea set in, the wounds did not heal, and the patient died three months after admission. There was no post-mortem. (i. 3613*.)

Excision of the rectum for carcinoma was performed seven times, five times by the perineal and twice by the sacral method (Kraske's operation).

PERINEAL.—A man, aged 56, with two months' symptoms, had a growth situated on the posterior and lateral wall of the rectum, two inches above the anus. (ii. 103.)

A man, aged 40, with eighteen months' symptoms, had a complete ring of cancer just within the anus, and extending upwards for about one inch. (ii. 2271.)

A man, aged 60, with five months' symptoms, had a growth involving the posterior and lateral parts of the rectum, from one to two inches above the anus. (ii. 2835.)

A man, aged 63, with three months' symptoms, had a growth on the left side only, from a half to three inches above the anus. (ii. 2430.)

A woman, aged 64, with six months' symptoms, had a growth on the posterior wall, one and a half inches above the anus. (v. 1821.)

All these five made good recoveries, and left the hospital at periods varying from three to eight weeks after the operation.

SACRAL.—A man, aged 50, with nine months' symptoms, had a growth on the posterior wall, extending higher than the finger could reach. It was removed by Kraske's operation, and no recurrence was present when the patient left the hospital on the eighty-third day after the operation. (ii. 457.)

A man, aged 41, had had for six months constipation, diarrhoea, blood in his motions and emaciation. On admission he looked thin and ill. There was a large mass of carcinoma beginning one inch from the anus, and extending upwards just as far as a finger could reach. The rectum was freely excised together with the coccyx and part of the sacrum. The removal was not considered to be very satisfactory; within three weeks there was recurrence. A month after the operation colotomy was proposed, but refused. Later delirium set in, and the patient was eventually discharged to an infirmary on the one hundred and first day after the operation. (iii. 2970.)

Local removal of carcinoma was performed upon a woman, aged 36, with a good result. (i. 20.)

Linear proctotomy was performed upon one man, aged 32, and three women, aged 36, 30 and 31. (iii. 3332 ; iii. 2006, iv. 509, v. 885.)

MISCELLANEOUS OPERATIONS.

Excision of tuberculous glands was performed eighteen times, and **eration of tuberculous glands** twenty times without any death or serious complication in any of the thirty-eight cases.

Excision or erasion of lupus was performed fourteen times with equally good results.

There was no death or any serious complication after any of the twenty-one operations for **enlarged tonsils** and thirty-nine operations for **adenoids** ; in most of these cases both operations were performed simultaneously on the same patient.

Excision of a branchial fistula was performed three times with excellent results. The patients were all males, aged 20, 14 and 15 respectively ; the fistula was at least two inches long in each case, and in the third case extended into the pharynx, which had to be opened during the operation. (i. 3704*, iv. 2551, v. 294.)

Excision of a spina bifida was performed twice, with a fatal result in each case.

A male infant, aged one week, was admitted with a thin-walled lumbar spina bifida. The sac was cut away and its neck tied ; death occurred three days later, and the post-mortem showed diffuse spinal meningitis and commencing hydrocephalus. (i. 1396.)

A male infant, aged 2 months, was admitted with a lumbo-sacral spina bifida, about two inches in diameter, and sessile. It had been growing steadily since birth. Its covering was very thin, but the sac was not particularly tense. There was no hydrocephalus. The sac was dissected out and the base transfixed and tied. It was a pure meningocele. The temperature remained normal throughout, and the wound did well, except that leakage of cerebro-spinal fluid occurred a few days after the operation. The child gradually became weaker, and died on the seventeenth day after the operation. The post-mortem showed no meningitis, but much hydrocephalus ; there was also much accumulation of cerebro-spinal fluid beneath the operation scar. (iii. 30.)

Removal of hydatid.—A woman, aged 24, was admitted with a swelling as large as a foetal head in the region of the left kidney. The diagnosis was uncertain. It was removed from the loin, and proved to be a hydatid cyst lying in the cellular tissue behind the kidney ; the peritoneal cavity was not opened. The patient made a good recovery. (iv. 2409*.)

Removal of submaxillary salivary gland.—A man, aged 38, had had a swelling in this region for two years ; four weeks ago a calculus had been removed. The suppurating and indurated salivary gland was then completely removed, with a good result. (v. 3119.)

OPERATIONS FOR HERNIA.

Herniotomy for strangulation was performed thirty-six times, with twelve deaths.

Femoral hernia.—Eight deaths, twelve recoveries.

FATAL CASES.—Two men, six women.

A man, aged 80, had had a hernia for two years ; for three days he had had mild symptoms of strangulation ; he was found to have a small hernia, which was not very tense. On the day after admission herniotomy was performed ; the operation lasted thirty minutes. The patient did well for four days, then became rather collapsed ; bronchitis set in, and he died on the fifth day after the operation. The post-mortem showed neither perforation nor peritonitis. Death was apparently due chiefly to old age. (ii. 1828.)

A man, aged 64, had had a hernia for twenty years. For three days he had had mild symptoms of strangulation ; herniotomy was performed, and the intestine, which was in good condition, was reduced ; some omentum was removed. The patient gradually sank, and died nine days after admission. There was no post-mortem. (iv. 3201.)

A stout woman, aged 68, who had had a *right* femoral hernia for twenty years, irreducible for six months, was admitted with symptoms of acute intestinal obstruction of five days' duration. The hernia was as large as an orange, and was not tense or painful. The abdomen was soft and slightly tender in the left iliac region. Nothing could be felt in the left femoral region. An incision was at once made upon the hernia ; a mass of omentum and some large intestine were found. The former was removed, and the latter, which looked normal, was reduced. Vomiting continued, and an internal strangulation was suspected ; the patient's condition, however, did not seem to justify further opening of the abdomen. The patient died on the third day, and at the post-mortem a small knuckle of gangrenous and perforated small intestine was found strangulated in a *left* femoral sac. The strangulated portion was six feet below the duodenum. (i. 2453.)

A woman, aged 61, with strangulation of three days' duration, died on the day after the operation. There was no post-mortem. (i. 678.)

A woman, aged 59, who had had a hernia for five years, was admitted with strangulation of four days' duration ; the hernia was large and tense ; on drawing down the bowel at the operation, fæces gushed out through a small hole in the gangrenous intestine. This hole was closed by Lembert's suture. The abdominal cavity was opened above the pubes and washed out. The patient quickly sank, and died eighteen hours after the operation. The post-mortem showed general peritonitis ; the sutures were holding satisfactorily. (ii. 399.)

A married woman, aged 41, had had a reducible hernia for many years ; fifty-one hours before admission it came down, and vomiting, constipation and pain set in immediately, and continued. On admission the patient was in much pain ; in the left femoral region was a hernia as large as an egg ; the skin over it was red and cedematous. Two hours after admission herniotomy was performed, no attempt at taxis being made. The sac contained omentum and gut, both of which were gangrenous. The sac ruptured during the operation. An incision was then made into the abdominal cavity, above Poupart's ligament, and through this the gangrenous intestine was drawn out. Three inches were then resected, the ends being joined with interrupted silk sutures, no button or other mechanical contrivance being used. The small intestine, four inches above the resection wound, was then stitched to the upper part of the wound in the abdominal wall, and opened ; a drainage tube was inserted into it. Most of the rest of the wound was then closed. The operation lasted two hours ; the patient was afterwards in fairly good condition, although somewhat restless. On the third day the wound broke down and the stitches cut out. At this time the patient's general condition was very good, and the temperature, which had been up to 101°, had returned to normal. She then gradually got worse, became more and more feeble, until she died on the tenth day after the operation. Until a few hours before death the temperature was normal, it then suddenly rose to 105°. The post-mortem

showed that all the intestinal sutures had cut out, the two cut ends of the intestine opening freely into the peritoneal cavity, which contained much pus. The seat of the hernia was found to be six feet below the pylorus. (iii. 283.)

A widow, aged 40, had first noticed a hernial swelling seven days before admission; for two days she had had pain and vomiting; there was no history of constipation. She was admitted in the evening, and the house surgeon did not consider her bad enough to require immediate operation—this was therefore delayed until the following morning. The gut was then found to be gangrenous, and the patient died on the second day after the operation. The post-mortem showed perforative peritonitis. (iii. 2652.)

A woman, aged 45, was admitted with strangulation of three days' duration; after the operation the temperature rose to 105°, and the patient died on the fourth day. At the post-mortem the wound looked healthy; there was much cedema of both lungs and some enteritis, but no perforation of the intestine or visible peritonitis. (iv. 1639.)

RECOVERIES.—One man and eleven women recovered. A man, aged 49, with strangulation of one day's duration. (i. 1732.) Women, aged 68, 62, 52, 69, 28, 51, 56, 59, 64, 67 and 53, with symptoms lasting respectively three, one, two, one, three, two, two, two, about five (?), twelve and three days. (i. 2778*, ii. 2482, 1608, iii. 1626, 1887, iv. 628, 1186, 461, 1636, 913, v. 2905*.)

Inguinal hernia.—Nine cases; eight men and one woman; all recovered.

RECOVERIES.—Seven of the men were aged 46, 44, 77, 41, 41, 20 and 43, and the symptoms had lasted respectively three days, a few hours, one day, a few hours, four days (omentum only), one day, and a few hours. (i. 493, ii. 322, 2396, iii. 3153, iv. 2465, v. 802, 1374.)

A bootmaker, aged 71, had had a hernia for twenty years and strangulation for one day; he had a large hernia upon which herniotomy was immediately performed. The operation was followed by catarrhal jaundice, and then ten days after the operation by delirium—apparently delirium tremens. He recovered from the operation and was then sent to an infirmary, on account of his mental condition. (v. 1026.)

The woman was aged 51, and had had symptoms of strangulation for at least two days. (ii. 1704.)

Umbilical hernia.—Seven cases; one man and six women; one man and three women died.

FATAL CASES.—A brass finisher, aged 58, had had for three years an umbilical hernia; he had occasionally had attacks of pain in it. Ten days before admission the hernia became much larger and vomiting began. The bowels had been opened until the day before admission. On admission there was a large soft hernia that could be partially reduced; the skin over it was much inflamed. He was treated with rest and fomentations. Seven days later the skin began to slough; the bowels still acted daily. An incision was made into the sac and some faecal fluid let out. Next day vomiting began again, so the sac was laid freely open and some gangrenous intestine and omentum removed. The patient gradually sank and died on the fifteenth day after admission. The post-mortem showed that there had been escape of faecal matter into the peritoneal cavity. (i. 580.)

A woman, aged 60, had had a hernia for twelve months, strangulated for four days. The patient died rather suddenly two days after the operation, probably from fatty degeneration of the heart. There was no post-mortem. (i. 223.)

A woman, aged 63, had had a large hernia for many years, strangulated for two days. On admission she was much collapsed, and she died on the day after the operation. The post-mortem showed more than a foot of gangrenous intestine, but no perforation. (i. 230.)

A fat woman, aged 55, had had a hernia for many years, strangulated for four days. She was desperately ill. Herniotomy and enterotomy were performed at once, but she died eight hours later. The post-mortem showed a large mass of strangulated omentum and a small knuckle of gangrenous intestine. (v. 2135.)

RECOVERIES.—A woman, aged 38, had had a large hernia for seven years, strangulated for one day. (i. 2324.)

A woman, aged 54, had had a hernia as large as a cricket ball for seventeen years, strangulated for a few hours. (iv. 1962.)

A woman, aged 57, had had a hernia for fifteen years, strangulated for two days. (ii. 2831*.)

A case of STRANGULATED VENTRAL HERNIA is described under enterectomy (p. 233). (ii. 1376.)

Radical cure of reducible hernia (excluding those cases of strangulation in which the operation for radical cure was performed at the same time as the herniotomy) was performed one hundred and thirty-five times upon one hundred and five male and thirty female patients. Similar operations performed on both sides of the body are counted as one operation. There were no deaths.

In three cases of FEMORAL hernia (males aged 42 and 29, and a female aged 27), the operation was followed by slight complications (bronchitis ii. 284, delirium tremens ii. 935, and pyuria v. 2513*.)

Among the cases of INGUINAL hernia, in three cases of male patients, aged 24, 11 and 6, the operation was complicated by the transplantation of a retained testis (v. 1958, 2375, 2729); in two other cases of men, aged 21 and 26, the operation was followed by orchitis (iii. 645, 3207); in one case of a man, aged 28, pneumonia followed (i. 328); in two cases of men, aged 22 and 23, parotitis followed (iv. 1016 and v. 697); in the case last mentioned, and also in a man aged 46, hæmorrhage occurred, and the abdomen had to be opened. These two cases were the following:—

A blacksmith, aged 23, was admitted with double incomplete hernia. Radical cure by Bassini's method was performed on both sides, some varicose veins in the canals being also tied; the operation presented no unusual difficulty. After the operation the patient gradually became very bad, with rapid small pulse, breathlessness, pain and distension of the abdomen. The temperature was below 101°. On the third day after the operation the wound in the left groin was reopened; about a pint of blood was found in the iliac fossa outside the peritoneum; the wound was packed. As the abdominal cavity also contained some blood, a drain was placed in the pelvis. The patient was transfused with saline solution. He was very ill for the next three days, and then made a slow but good recovery, and left the hospital quite well, and with the wound healed, on the seventy-second day after the operation. (v. 697.)

A labourer, aged 46, was admitted for a large hernia, which had existed at least eighteen years. The sac was opened, the intestine reduced, and a mass of omentum tied and cut away, the stump being then returned. Hæmorrhage from the abdomen then immediately set in. The wound was at once enlarged upwards, the abdominal cavity freely opened, and the omental stump found; a bleeding vessel in it was secured. The stump was again tied and returned

to the abdomen. The inguinal canal was then sewn up, and the man made a good but slow recovery, leaving the hospital four months after the operation with the wound healed. (iii. 82.)

There was one case of ventral hernia, a woman, aged 53, who had undergone ovariectomy twelve years previously. (iii. 2017.)

Radical cure of irreducible hernia was performed twenty-one times upon eleven male and ten female patients. There was no death or serious complication of any kind. One of these cases was an interstitial hernia with a retained testis; the latter was removed. (iii. 362.)

COLOTOMY.

Inguinal colotomy was performed twenty-two times, with seven deaths; for malignant disease it was performed nineteen times, with five deaths; for fibrous stricture of the rectum three times, with two deaths.

For CARCINOMA.—FATAL CASES.—A labourer, aged 40, was admitted with a history of five months' chronic constipation and nine days' complete obstruction. On the day before admission a trocar had been plunged into the cæcum (outside the hospital). Symptoms of peritonitis followed this proceeding. The abdomen was greatly distended and tender, and there was redness and tenderness in the region of the puncture. The abdomen was opened in the middle line; commencing peritonitis was found, and a small carcinomatous growth in the splenic flexure of the colon. Another incision was then made over the cæcum, and the latter brought out and opened. Much thin faecal matter escaped. The patient died twelve hours later. There was no formal post-mortem. (v. 1067.)

A woman, aged 50, was admitted with the history that all her life she had been constipated, that for four months the constipation had been much worse, and that for twelve days it had been absolute. Nine days before admission vomiting set in, but was not frequent or severe. The abdomen had been gradually distending. On admission the patient's general health seemed good; she was not wasted. The abdomen was distended, but quite soft and not tender. Nothing could be felt in it or per rectum. She was treated at first by enemata, but on the third day after admission a left inguinal colotomy was performed. The moderately distended sigmoid flexure was drawn out and fixed to the abdominal wall by sutures; no growth could be felt; it was opened on the following day, but the symptoms were not relieved. One day later the abdomen was again opened over the cæcum, but this was found to be so bound down by adhesions that it could not be brought up to the wound. A coil of small intestine was therefore brought out and opened, but the patient gradually sank and died two days later. The post-mortem showed a small ring of carcinoma at the junction of the descending colon and sigmoid flexure. (v. 1280.)

A shopkeeper, aged 48, had had for two years constipation and irritation about the rectum; for four months he had had considerable pain across the lower abdomen and had passed blood per rectum. Lately he had lost much flesh. On admission there was some abdominal distension and a large tender hard mass in the left iliac fossa. Three weeks after admission colotomy was performed in the middle line above the umbilicus; the gut was fastened by sutures without a glass rod. This wound did well and the man was considerably relieved, but the iliac swelling continued to increase and cause much pain. An incision in the left loin let out more than two pints of faeculent pus. The patient gradually sank and died on the sixty-second day after the colotomy. The post-mortem showed a carcinomatous stricture twelve inches above the anus. This had perforated the wall of the bowel, and set up foul

suppuration in the cellular tissue of the abdominal wall and iliac fossa. The suppuration had shortly before death extended into the peritoneal cavity. (iii. 2693.)

A man, aged 49, who had had symptoms of carcinoma of the rectum for at least six months, was admitted in a feeble condition and very ill. Six days after admission left inguinal colotomy was performed, no glass rod being used and the bowel not being opened. Much fluid was found in the peritoneal cavity, and numerous nodules of secondary growth were seen in the peritoneum. The patient did fairly well until four days later, when in a fit of coughing some omentum and intestines protruded through the wound. The patient was again anaesthetised, and by means of a fresh incision through the middle line of the abdomen the viscera were replaced. The patient never rallied, but died six hours later. The post-mortem showed also some dilatation of the kidneys from involvement of the ureters in the pelvic growth. (ii. 2939.)

A clerk, aged 53, had had symptoms of carcinoma of the rectum for about five months; for six weeks he had been much worse. On admission he was very ill with hiccough and much distension of the abdomen. Inguinal colotomy was performed on the day after admission, a glass rod being used and the gut opened at once. A carcinomatous growth was found at the upper part of the rectum. The patient steadily grew worse, and died two days later. There was no post-mortem. (iv. 1156.)

RECOVERIES.—A woman, aged 60, was admitted in good condition, but with a greatly distended abdomen and a history of nine days' constipation without vomiting. Six days later, the general condition being the same but the distension increasing, a left inguinal colotomy was performed, and the enormously distended colon opened at once and sutured to the abdominal wall. A glass tube was tied into the bowel. Malignant growth was felt in the sigmoid flexure. The patient made an excellent recovery, and left the hospital on the thirtieth day after the operation. (ii. 1444.)

A man, aged 27, was admitted with a tumour of the left iliac region, believed to be carcinoma of the sigmoid flexure. He had been ailing for more than two years, and had had intestinal symptoms for about nine months. There was some abdominal distension. Two days after admission inguinal colotomy was performed, and the gut opened three days later. No glass rod was used. The patient made a good recovery from the operation, and left the hospital on the twenty-first day after it. (v. 2772.)

The case of the man, aged 59, who successfully underwent colotomy, and subsequently enterectomy, is described under the latter (p. 233). (ii. 1333.)

A woman, aged 38, who had had for one month diarrhoea, and for one week complete constipation, was admitted with a tense distended abdomen and a carcinomatous stricture of the rectum. Colotomy was performed on the day of admission, and the bowel opened at once; a tube was tied in. No glass rod was used. (ii. 256.)

A woman, aged 40, with three months' symptoms, was admitted with carcinoma of the rectum without much obstruction. Colotomy was performed at once, and the bowel opened immediately; no glass rod was used. (ii. 2771*.)

A woman, aged 53, with three months' symptoms of carcinoma of the rectum, was admitted with increasing constipation and slight distension; colotomy was performed a month later; a glass rod was used, and the bowel opened on the ninth day. (ii. 1931.)

A nurse, aged 65, with four weeks' symptoms of carcinoma of the rectum and slight distension, underwent colotomy a month after admission. A glass rod was used, and the bowel opened on the third day. (iv. 1183.)

A plumber, with a carcinoma high up in the rectum and a history of six months' symptoms, underwent colotomy eight days after admission. A glass rod was used, and the bowel opened on the fifth day. (i. 1369.)

A tailor, aged 55, with twelve months' symptoms of the same disease, but no obstruction, underwent colotomy three days after admission; no glass rod was used, and the bowel was opened on the fifth day. (iii. 1015.)

A porter, aged 58, had had diarrhoea for two years; in the rectum, just within reach of the finger, was a carcinomatous growth. A week after admission colotomy was performed, and the gut opened on the fifth day; no glass rod was used. (ii. 1671.)

A man, aged 60, with symptoms of carcinoma of the rectum of one year's duration, underwent colotomy, no glass rod being used; the gut was opened on the third day. (ii. 2052.)

A labourer, aged 68, who had had hæmorrhage and other symptoms of carcinoma of the rectum for thirteen months, underwent colotomy five days after admission. No glass rod was used, and the bowel was opened on the fifth day. (iii. 810.)

A timekeeper, aged 70, with symptoms of carcinoma of the rectum of eight months' duration, underwent the same operation; no glass rod was used, and the bowel was opened on the fourth day. (ii. 1104.)

A dustman, aged 72, with the same disease, of four months' duration, but without obstruction, underwent colotomy on the fourth day after admission. A glass rod was used, and the bowel opened on the fourth day. (iv. 631.)

FOR FIBROUS STRICTURE OF THE RECTUM.

FATAL CASES.—A married woman, aged 30, was admitted with a well-marked fibrous stricture of the rectum. For years she had been constipated, and for about two months the bowels had been opened only about twice a week. There was no abdominal distension, but on account of the increasing constipation it was decided that a left inguinal colotomy should be performed. This was done on the fourteenth day after admission, about eight inches of distended sigmoid flexure being brought out and fixed by numerous sutures, the projecting portion then cut away at once; no glass rod was used. The operation was followed almost immediately by collapse and vomiting; the patient gradually grew worse, and died on the fourth day after the operation. Much faecal matter came away through the wound at and after the operation. At the post-mortem it was found that about half an inch of the line of sutures had given way, and that the bowel at this place had receded into the abdomen, thus allowing extravasation of faeces into the peritoneal cavity, and setting up fatal peritonitis. (ii. 996.)

A servant, aged 48, was admitted with chronic intestinal obstruction caused by extensive carcinoma of the uterus pressing on, but not infiltrating, the rectum. Seventeen years previously a fibrous stricture of the rectum had been divided with an excellent result, but in the last year constipation had again become very troublesome. Eighteen days after admission inguinal colotomy was performed; no glass rod was used, and the gut was opened on the fifth day. The result was good, and the patient was relieved for a time, but she eventually became greatly emaciated, and died of the malignant disease on the fifty-eighth day after the operation. There was no post-mortem. (iii. 2835*.)

RECOVERY.—A coastguardsman, aged 33, had had a fibrous stricture for six years, and colotomy was performed on account of pain and hæmorrhage six weeks after admission; no glass rod was used, and the gut was opened next day. The patient made a good recovery, and left the hospital seven weeks later. (ii. 119.)

ABDOMINAL SECTION.

For tuberculous peritonitis.—Three cases, with one death.

A boy, aged 5, who had suffered from diarrhoea and loss of flesh for about six weeks, was transferred from a medical ward with a tender and distended abdomen. The abdomen was opened, and much clear fluid let out. Numerous miliary tubercles were seen on the peritoneum. The wound, which was closed without drainage, became infected with tubercle, but eventually healed, and the boy left the hospital seventy-two days after admission, having gained flesh, and being much improved in general health. The fluid did not reaccumulate in the abdomen. (v. 1013.)

Another boy, also aged 5, was transferred from a medical ward with the diagnosis of probable tuberculous peritonitis, but possible cirrhosis of the liver; the abdomen was greatly distended. At the operation a large quantity of clear fluid was let out; no disease of either peritoneum or liver was actually seen. The abdomen was drained, and considerable improvement ensued, the patient returning to the medical ward eighteen days after the operation, and leaving the hospital six weeks later still. (v. 1852.)

A dairymaid, aged 18, had suffered for ten months from slight abdominal pain and gradually increasing abdominal distension. She had previously been quite well. She was at first admitted to the gynæcological ward as an ovarian tumour, and then transferred. The abdomen was fully distended and moderately hard, but scarcely at all tender; it was resonant in front, but somewhat dull in the flanks and hypogastrium. The temperature was normal. The abdomen was opened, and much yellow jelly-like clot, together with a little fluid, removed from the peritoneal cavity. The surrounding adhesions, which were numerous, were broken down, and the omentum, which was greatly enlarged and infiltrated with tubercle, was removed. The operation was a very long and severe one, and the patient died thirty-six hours later; the temperature had risen steadily after the operation. (ii. 987.)

For perforative peritonitis.*

PERFORATED GASTRIC ULCER.—Two cases; both died.

A parlourmaid, aged 24, had had breakfast (one piece of toast and one cup of tea) at 8.30 a.m.; at 9.45 a.m. she was suddenly seized with violent abdominal pain and collapse, and at 12.45 she was admitted to the hospital. The abdomen was then very painful, tender and rigid, and she was still much collapsed. One hour later, exactly four hours after the first onset of symptoms, the abdomen was opened in the middle line. At first nothing abnormal was seen, but on lifting up the great omentum, and tearing through the gastro-colic fold, much thin fluid escaped; there was no free gas. On lifting up the stomach a perforated ulcer was found on the posterior wall. This was sutured with a double row of fine silk stitches, and the whole abdominal cavity then very thoroughly washed out and drained at its lower part. For the first few days the patient was fed chiefly by enemata, and did well; her temperature was only once above 100°, and in the last three days was subnormal. On the ninth day after the operation she suddenly became collapsed, and died in a few minutes. At the post-mortem, with the exception of a few recent adhesions about the stomach and spleen, the whole of the peritoneal cavity looked perfectly healthy. The ulcer of the stomach was situated on the posterior wall near the middle of the lesser curvature, and had been firmly closed. Within the stomach were two other ulcers that had not perforated. (ii. 1051.)

A waitress, aged 22, was suddenly seized at 11 a.m. with severe abdominal pain and collapse, and was brought soon afterwards to the hospital. For about a fortnight she had suffered from slight indigestion, but had had no other gastric symptoms. On admission the abdomen was slightly tender all

* For other cases see Appendicitis, &c.

over; there was no unnatural dulness, and the liver dulness was normal. Temperature 98°; pulse 80. Six hours after the first onset of symptoms the abdomen was opened by an incision in the middle line above the umbilicus. Free gas escaped immediately, and a perforated ulcer of the stomach was found on the anterior wall near the œsophageal end of the lesser curvature. The ulcer was excised, and the cut edges of the stomach united by three separate rows of sutures in mucous membrane muscle and peritoneal coats respectively. The abdomen was not sponged, but was irritated with 1 in 8,000 biniodide of mercury lotion for fifteen minutes, and then with boracic lotion for another ten minutes, until the returning fluid was quite clear. The whole operation lasted an hour and a quarter, and was well borne. Afterwards there was a good deal of restlessness and occasional vomiting. The temperature after the first few hours rose steadily to 107° on the third day, when the patient died. The post-mortem showed less than a drachm of fluid in the peritoneal cavity, but there was a little sticky lymph in most parts of it. The hole in the stomach was firmly closed. On the posterior wall of the stomach, just opposite the site of the excised ulcer, was a second smaller one which had not perforated. (v. 2565.)

PERFORATED TYPHOID ULCER.—A boy, aged 10, was admitted very ill with general peritonitis. For a fortnight he had been feeling ill, but had been able to go to school until five days before admission, when diarrhœa, abdominal pain and vomiting necessitated confinement to bed. For two days he had had constipation and distension of the abdomen. The vomiting continued, and he got steadily worse. On admission, respiration was shallow and rapid, pulse 160, temperature 103°. The abdomen was distended, slightly tender and not moving with respiration. *Liver dulness was absent*, and there was slight œdema of the abdominal wall. The case was clearly one of peritonitis, which was thought to be due to appendicitis. An incision was immediately made parallel with and above the outer half of Poupart's ligament on the right side, and much gas and lymph, and then foul yellow fluid, and what looked like clotted milk, let out from the peritoneal cavity. The abdominal cavity was then washed out very thoroughly for about ten minutes with 1 in 8,000 perchloride of mercury solution, and drained in three places. The boy died two hours later. The post-mortem showed a large quantity of thin yellow intestinal fluid all over the peritoneal cavity; at a point eleven inches above the ileo-cæcal valve was a perforation, one-eighth of an inch in diameter, of a typhoid ulcer. There were several other typical typhoid ulcers in the intestine. The sloughs had already separated from them. The case was clearly one of perforated typhoid ulcer. Not until afterwards did it transpire that two other people in the same house were suffering, or had recently suffered, from typhoid fever. (v. 3247.)

For supposed gastric ulcer.

A servant, aged 27, had been in three other hospitals, nine, five, and one and a half years ago, with hæmatemesis, supposed to be due to gastric ulcer. Five weeks ago she had been suddenly seized with violent abdominal pain and faintness, and subsequently had melæna. Vomiting occurred frequently from this time onwards. On admission nothing abnormal could be felt in the abdomen, which was not distended. After a consultation, it was decided to open the abdomen and suture the stomach over the supposed gastric ulcer. When the abdomen was opened the stomach seemed quite normal, and no adhesions were found. The wound was therefore simply closed again. The patient made a good recovery, and when she left the hospital, twenty-four days later, she had lost all her pain and vomiting, and seemed quite well. (v. 1129.)

For hydatid of liver.

A healthy-looking girl, aged 4, was admitted with two painless rounded swellings in the liver; they had been noticed two months. Both were

removed by abdominal section on two separate occasions, and the child made an excellent recovery. (i. 1695*.)

A boy, aged 8, had had a painless rounded swelling in the liver for three months. The abdomen was opened, a hydatid cyst opened and drained, and a good recovery followed. (i. 3273.)

Cholecystotomy.—Performed eight times, with one death; all the patients were women between the ages of 30 and 60; gallstones were present in all the cases.

RECOVERIES.—A woman, aged 53, had been subject for ten months to attacks of biliary colic, with slight jaundice; the gall bladder could be felt indistinctly. Cholecystotomy was performed, and two stones, each half an inch in diameter, were removed. The patient was discharged thirty-four days after the operation with a small biliary fistula. (iii. 630.)

A woman, aged 43, was admitted for pain and swelling in the region of the gall bladder. The pain had lasted three months, and there had been several acute attacks; there had never been any jaundice. The gall bladder was opened and five large calculi were removed, together with ten ounces of clear yellow fluid. The gall bladder was drained, and a good recovery followed, the patient leaving the hospital on the thirty-sixth day after the operation with the wound quite healed. The swelling had been diagnosed outside the hospital as a moveable kidney. (iv. 713.)

A woman, aged 31, had been sent to the hospital as a case of moveable kidney; she complained chiefly of dull pain in the right loin. In the region of the gall bladder a tumour was easily felt; it could also be felt very easily at the back of the loin, just below the last rib. The tumour proved, on abdominal section, to be an enlarged gall bladder; four ounces of clear fluid and several stones were removed, and a good recovery followed. (iv. 2320.)

A woman, aged 31, had for two months noticed pain and swelling in the region of the gall bladder; she had never had jaundice or colic. The gall bladder, which was much distended, was opened, and a large stone was removed from its neck. The gall bladder was drained for eight days, and the patient left the hospital on the twenty-first day after the operation quite well, and with the wound healed. (v. 977.)

A woman, aged 37, had had for six weeks a swelling in the region of the gall bladder; six years ago she had had jaundice and biliary colic, and she had had several attacks since; on admission there was no jaundice; the enlarged gall bladder could easily be felt. At the operation fifty-two gallstones were removed, and the gall bladder drained. The patient made a good recovery, and left the hospital on the forty-third day after the operation with the wound almost healed. (v. 2951*.)

A woman, aged 45, had had symptoms of gall stones for four years; she had had several attacks of colic, increasing in frequency and severity. The gall bladder could be felt; there was no jaundice. Three large facettted stones were removed, and the gall bladder drained. The patient made a good recovery, and left the hospital on the thirty-third day after the operation with the wound almost completely healed. (v. 2950.)

A woman, aged 59, was admitted with a large moveable swelling in the right loin. It had been noticed for about two years, and had lately caused a good deal of dragging pain. There had been no jaundice and no urinary symptoms. The diagnosis between gall bladder and kidney was uncertain. The abdomen was opened, and half a pint of turbid fluid let out from the gall bladder. The latter was drained for two days. The patient made a good recovery, and left the hospital on the forty-second day after the operation quite well, and with the wound closed; it subsequently reopened, however. (ii. 771.)

A married woman, aged 45, who for two years had suffered from dyspepsia, and for two weeks had not been feeling well, was suddenly seized, four days before admission, with violent pain in the right hypochondrium, followed by vomiting. There was no history of any previous abdominal trouble. She was treated for two days in a medical ward, and the peritonitis subsided somewhat, and an ill-defined swelling appeared in the above region. She then again became much worse with more pain and vomiting and a rapid running pulse. The abdomen was then opened; much orange-coloured fluid ran out. There was much peritonitis, apparently general. Cholecystotomy was performed, and sixty small stones removed. It was believed that perforation of the gall bladder had occurred, but the patient seemed too ill to permit of a more thorough examination. The abdomen was washed out with sterilised water. The patient died collapsed seven hours later. The post-mortem showed the cystic and common ducts to be full of stones. The gall bladder was much thickened and distended, and at the middle of its under-surface was a minute perforation at the bottom of an ulcer evidently caused by the stones. The peritonitis had been at first localised, then general. (iii. 708.)

Cholecystectomy.—Performed twice; both patients recovered.

A hospital porter, aged 53, had had, for three months only, many severe attacks of biliary colic without jaundice. Some tenderness and sense of resistance was felt in the right hypochondrium, but no tumour. A vertical incision was made from the tip of the ninth costal cartilage, and the gall bladder was drawn up and opened; about a drachm of dark viscid bile escaped together with several small gallstones; another larger stone could be felt impacted in the cystic duct, and could not be extracted. The duct was therefore tied beyond the stone, which was then removed together with the whole gall bladder. The wound was drained for seventeen days, a little blood-stained fluid coming away for the first few days. The patient made an excellent recovery, and left the hospital on the twenty-ninth day after the operation, quite well. Although he subsequently had some more pain, yet he was able to resume his occupation at the hospital. (v. 1877.)

A woman, aged 52, was admitted to the gynæcological ward with a fibroid of the uterus and a rounded, very moveable lump, as large as a fist, situated just to the right of the umbilicus. The nature of this lump was doubtful, but it was believed to be a moveable kidney. The history was that nine years ago she had strained herself in lifting, and soon afterwards she had noticed this lump; the lump had occasionally disappeared. For six months she had had a good deal of pain. As this pain incapacitated her from work, the abdomen was opened and the tumour exposed. It was covered by omentum, some of which was removed. The swelling was found to be a globular smooth cyst with a thick wall, and having a thin layer of liver tissue spread over it. The nature being still uncertain, it was decided to remove it. A satisfactory pedicle was obtained and the tumour cut away; no duct was seen. The wound was drained with a glass tube. The tumour, when cut into, was found to be the gall bladder, with walls nearly a quarter of an inch thick, and containing thick white viscid matter and one large and several small faceted gallstones. She was fed by nutrient enemata at first, and made an excellent recovery, leaving the hospital on the twenty-seventh day after the operation with the wound almost healed. (Martha 235.)

For ABSCESS OF LIVER.—Five cases; one death.

An engineer's labourer, aged 28, who had been abroad, but had never had dysentery, was admitted on account of hepatic pain of three months' duration. There was a definite swelling in the epigastrium. A fortnight after admission an incision was made into the swelling and much discoloured pus let out. The cavity was drained and slowly healed up, the patient leaving the hospital on the thirty-fourth day after the operation. (ii. 2954.)

A labourer, aged 28, who had been a soldier in India, was admitted with an abscess of the liver ; symptoms of hepatitis had existed nearly two years. An incision was made into the abdomen directly over the abscess, and the latter aspirated, about a pint of pus being withdrawn ; the liver was then sewn to the abdominal wall, to shut off the peritoneal cavity as much as possible ; the opening into the abscess cavity was then enlarged and drained with a glass tube. The patient made an excellent recovery, and left the hospital on the seventy-fifth day after the operation in good health, but with a small sinus not quite closed. (iii. 2144.)

A carman, aged 24, who had never been out of England, and had never had dysentery or ague, was admitted with a hepatic abscess pointing in the epigastrium. Six months previously he had had an attack of diarrhoea and melæna ; three weeks ago he had first noticed the swelling in the abdomen. The abscess was opened by direct incision, the general peritoneal cavity not being opened. The patient made a good recovery, and left the hospital three weeks later with a small sinus not quite closed. (iv. 663.)

A coloured student, aged 34, who had been in West Africa, had had for two years pain in the liver. In the last two months the pain had been worse and he had had rigors. He was admitted to a medical ward with a distinct tumour in the right hypochondrium ; this was punctured and some pus was let out ; he was then transferred to a surgical ward. A direct incision was made into the abscess, which was adherent to the abdominal wall ; several ounces of pus were let out, and the abscess cavity was washed out and drained. He made a good recovery, and left the hospital a month after the operation with a sinus not quite healed. (v. 2589.)

A nursery maid, aged 19, was admitted to a medical ward for pain and swelling in the region of the liver. The illness had begun twelve months previously with sudden pain in the right iliac fossa, causing her to lie up for a month. A few weeks later another similar attack occurred, for which she was treated in another hospital. Since that time she had had constant pain in the right side of the abdomen, with occasional vomiting and diarrhoea. After admission the pain and swelling about the liver gradually increased ; there was much dullness at the base of the right lung. Three months after admission an incision was made in the loin and six ounces of pus let out. Subsequently a counter-opening was made ; but the suppuration never ceased, rigors occurred, and the patient gradually sank, dying six months after admission. The post-mortem showed a small single simple ulcer of the hepatic flexure of the colon ; this had perforated and set up a hepatic and perihepatic abscess ; the former had been opened, but the latter only indirectly. There was some pleurisy at the right base. The appendix was quite healthy. (iv. 2364*.)

[See also two other cases of hepatic abscess, described under Excision of a rib. (Male ii. 332, and Medical Register Male 1, 146A.) Both of these died.]

For Abscess of spleen.

A man, aged 30, was admitted to a medical ward for left pleurisy and abdominal pain. He had been ill for about three weeks, and had previously had good health. Half a pint of clear fluid was withdrawn from the left pleura. Abdominal pain and tenderness became more marked, and a swelling appeared below the costal arch on the left side. A month after admission this became so marked that he was transferred to a surgical ward and an incision made through the abdominal wall below the costal arch, and about a pint and a half of pus let out from a cavity more or less localised in the abdominal cavity. A fortnight later a piece of rib was resected and a counter-opening made, but the patient gradually sank and died three weeks afterwards. The post-mortem showed an abscess of the spleen with much suppuration around that organ. The main cavity had been well drained, but not that in the spleen itself. There was also suppurative pylephlebitis. (iv. 585.)

For Intra-abdominal abscess.

A labourer, aged 40, was admitted with an indistinct swelling in the upper part of the abdomen following a "strain" a month previously. The swelling gradually became more pronounced, especially in the right lumbar and hypochondriac regions. A suppurating hæmatoma commencing in the lesser peritoneal cavity was diagnosed. Fifteen days after admission the swelling was aspirated, turbid fluid being withdrawn; the abdomen was then opened and about fifteen ounces of pus mixed with blood clot was withdrawn. The wound was drained and packed with gauze. The patient, although very ill for a day or two, made a good recovery, and left the hospital on the thirty-seventh day after the operation. When seen again, three weeks later, the wound was soundly healed and the patient quite well. (i. 3422*.)

For Pelvic abscess.

A married woman, aged 26, had had abdominal pain for about one month and was admitted with a temperature of 102°. An inflammatory swelling was found to occupy most of the left side of the pelvis. Three days after admission the abdomen was opened; the adherent omentum was tied, and the abscess having burst and given exit to a quantity of foul pus, the abdomen was washed out, and the wall of the abscess dissected away with much difficulty. The wound was drained. Patient never recovered from the collapse, and died next day. (Martha 266.)

For Cyst of pancreas.

A man, aged 19, had been in good health until one hour after doing some gymnastic exercises, when he was suddenly seized with abdominal pain and vomiting. Both symptoms continued until a few hours later. There was then some general distension of the abdomen, but no tenderness. In the umbilical region an indefinite deep-seated rather large tumour could be felt. Pulse 120; temperature 101°. No diagnosis was made, but the symptoms appeared to point to some form of intestinal obstruction. Six hours after the onset of symptoms, the abdomen was opened in the middle line, and a large rounded purplish mass, some six inches in diameter, was exposed, apparently consisting of a number of blood cysts; it was covered with peritoneum, and was believed to be in the great omentum. The tumour was clearly irremovable, so some of the cysts were punctured and the wound closed. The patient did well for a week; the stitches were then removed; on the following day vomiting set in, and the abdominal wound was found to have gaped, omentum protruding through it. This was replaced, but the vomiting continued, and the patient died on the tenth day after the operation. The post-mortem showed multi-locular cystic disease of the pancreas, the head of which had been converted into a large globular mass of cysts, varying in size from that of a large walnut downwards. Into most of these hæmorrhage had occurred, and it was evident that recent hæmorrhage into the cysts had caused pressure upon the duodenum, and thus set up the acute symptoms of obstruction. It subsequently transpired that for several months the patient had complained of constipation and griping pain about the abdomen. (ii. 3317.)

Gastrostomy.—Two cases; one death.

A printer, aged 55, had had dysphagia for five months and vomiting for three months. On admission he was very thin and ill. There was a stricture at the lower end of the œsophagus admitting only a small bougie. On the seventh day after admission, gastrostomy was performed by Albert's method, and the stomach opened at once. The patient gradually sank and died two days later. At the post-mortem the stomach was found to be well-united to the abdominal wall, and there was no peritonitis. There was, however, much septic consolidation of one lung, caused by direct extension of the epitheliomatous growth through the œsophagus into the lung. (i. 1649.)

A woman, aged 28, was admitted much emaciated with a fibrous stricture of the œsophagus, twelve inches from the teeth, produced by swallowing hydrochloric acid two months previously. Nothing could be passed through the stricture. Gastrostomy was performed. The patient was fed by the rectum for two days, then by the mouth; the stomach was opened on the seventh day. She made an excellent recovery, and left the hospital on the forty-ninth day after the operation in good health, and having had no ulceration or other trouble about the wound. (iv. 2650*.)

Gastro-enterostomy.—Five cases; two deaths.

RECOVERIES.—A man, aged 29, was admitted on account of a simple stricture of the pylorus, produced by accidentally swallowing some hydrochloric acid three months previously. He was greatly emaciated and vomited frequently. No tumour could be felt. In the first eight days his stomach was washed out frequently, and he was fed chiefly by the rectum. Gastro-jejunostomy was then performed, the intestine and stomach being united by silk sutures without the aid of any button. Some trouble was experienced with a quantity of solid undigested food in the stomach; this was all removed. The operation lasted an hour and forty minutes, and injections of strychnine and ether had to be given towards the end. The patient, however, quickly rallied from the collapse. After the operation he was fed by the rectum; he was very troublesome and restless, and on the fifth day insisted on getting up and going home. Three weeks later he was seen at home, having apparently quite recovered. The highest temperature after the operation was 99·6°. (ii. 2073.)

A plumber, aged 37, was transferred from a medical ward with carcinoma of the pylorus. His symptoms had lasted eight months, and were pain, vomiting after food, and progressive emaciation. The patient was very thin; a tolerably well-defined tumour could be felt in the region of the pylorus. Gastro-jejunostomy was performed through a median incision, Murphy's large oval button being used. The anterior surface of the stomach was united to the beginning of the jejunum. For a week after the operation the patient was fed by the rectum. He made a good recovery, and left the hospital thirty-one days after the operation. The button had not then been passed. (v. 364.)

A married woman, aged 47, was admitted with a dilated stomach and a history of frequent vomiting for two years and emaciation for some weeks. Seventeen years ago she had vomited a quantity of blood on one occasion only. Seven days after admission gastro-jejunostomy was performed, Murphy's large oval button being used. The pylorus was felt to be thickened, and a large hard gland was found near it. The operation lasted half an hour. The patient recovered well from the operation, and her symptoms were relieved for a time. She left the hospital on the thirty-first day after the operation, but was readmitted a week later on account of a considerable painful and tender swelling in the epigastrium. Nothing more was done, and after five days' stay, she again left the hospital in the same condition as on admission. Her private doctor subsequently reported that she became gradually worse, and died three months after leaving the hospital; the button was never passed. No post-mortem could be obtained. (v. 2257 and 2611.)

DEATHS.—A married woman, aged 36, was admitted for carcinoma of the pylorus. Nine years previously she had had a single attack of hæmatemesis; after this there were no marked gastric symptoms until five weeks before admission, when frequent vomiting and gastric pain began. On admission the general condition was pretty good; a distinct tumour, as large as a walnut, could be felt in the region of the pylorus. Ten days after admission, gastro-enterostomy was performed, a round one-inch Murphy's button being inserted, and a ring of Lembert's sutures around this. A portion of omentum containing a carcinomatous nodule of growth was removed. The patient continued to vomit, and died of peritonitis four days later. The post-mortem showed a

small localised carcinoma of the pylorus with much stricture. There were no secondary growths and no enlarged glands other than those already mentioned. (iii. 1269.)

A woman, aged 56, was transferred from a medical ward with carcinoma of the pylorus. Emaciation, pain and vomiting after food had been present about ten months. A distinct tumour could be felt, and the patient was cachectic and very ill. Gastro-jejunostomy was performed, the first part of the jejunum being united to the posterior wall of the stomach by three rows of silk sutures. No button was used. The operation lasted one hour and a quarter. The patient never rallied from it, and died on the third day afterwards. The post-mortem showed that none of the sutures had cut out, and that there was no leakage. There was a very small amount of sticky lymph around the operation area, but the rest of the peritoneum was healthy, except for the growth which was in the pylorus, liver and other parts. (v. 456.)

For Acute intestinal obstruction.

STRANGULATION BY A BAND.—Three cases ; one death.

A woman, aged 27, had had a "tumour" removed by abdominal section at another hospital six years ago. Since that time she had been quite well until two days before admission, when after a heavy meal she was suddenly seized with pain and vomiting. Both symptoms continued, but constipation was not absolute. On admission the abdomen was moderately distended, but soft. For nine days afterwards the patient was treated by nutrient enemata and other non-operative measures, but as she was at the end of that time not improving, and still vomited occasionally, the abdomen was opened. A band of adhesions was found partially constricting the small intestine, close to the old scar. This was divided ; all symptoms subsided, and the patient made an excellent recovery, leaving the hospital eighteen days after recovery. (v. 1774.)

A monthly nurse, aged 56, had been operated upon for strangulated femoral hernia at another hospital four months before admission. The gut was in a bad condition, but was returned to the abdomen ; abdominal pain and symptoms of chronic obstruction soon followed. On admission the abdomen was much distended, but soft. A fortnight after admission the abdomen was opened, and a piece of small intestine found to be firmly bound down to the uterus. This was freed with some difficulty ; the wound was drained with gauze. When the latter was removed, twenty-four hours later, faeces began to come through the wound. This condition persisted, and undigested food was noticed at times to pass through the fistula. Exactly four weeks after the first operation the abdomen was re-opened, and eight inches of small intestine, together with the fistula, were removed. The cut ends of intestine were joined by a one-inch Murphy's button. There were many adhesions, and the operation lasted an hour and a half ; the insertion of the button took twelve minutes. A little mucous membrane protruded at one point, and here a single Lembert's suture was put. The abdomen was drained for five days, and the patient made an excellent recovery, passing the button on the sixteenth day, and leaving the hospital on the thirty-sixth day after the last operation. When seen again, three months later, she was still in excellent health. (v. 1026.)

A boy, aged 11, went to a school treat and was sick soon afterwards ; nevertheless, he went to school for the next two days ; on the fourth day he complained of pain across the lower abdomen, and again vomited. Next day and the day after he vomited several times and had more pain ; the bowels had not been opened for two days. He was brought to the hospital ill and in much pain with a uniformly distended abdomen. For the next two days he was treated by enemata with little result ; he vomited occasionally and seemed to get rather better ; he passed flatus each day. On the third day after admission the abdomen was much distended, coils of small intestine being visible. The abdomen was opened in the middle line ; numerous bands of adhesions were found, and two of them were divided. The bowels gave way

at one spot, and the rent was immediately sewn up. The patient was much collapsed after the operation, and died twelve hours later. The temperature had been normal until the time of operation. At the post-mortem two old constrictions of the small intestine were found; both were within two feet of the ileo-cæcal valve. The bands that had caused them had been divided. There were numerous other adhesions, the result of old peritonitis (there was a history of a long abdominal illness five years before); there was no tubercle in the peritoneum or mesenteric glands, and the appendix, although bound down by adhesions, showed no evidence of old or recent disease. The rent in the bowel had been firmly sutured. The case was one of sub-acute strangulation by bands, probably the result of old simple peritonitis. (iv. 394.)

STRANGULATION THROUGH HOLE IN OMENTUM.—A painter, aged 50, had been subject to constipation for twenty years. Seven days before admission he was seized with sudden abdominal pain, followed by vomiting, and then by distension of the abdomen. The symptoms gradually became more severe until admission. An incision was then at once made as for inguinal colotomy; on opening the peritoneal cavity a quantity of blood and clot escaped; the case was thought to be one of malignant disease or possibly aneurism; the wound was drained. The patient died two days later. At the post-mortem it was found that twelve feet of small intestine had been strangulated through a hole in the omentum, and that the hæmorrhage was from the intensely congested intestine. (v. 626.)

For Intussusception.—Three cases; two deaths.

A female infant, aged 10 months, was admitted with an intussusception, the symptoms of which had lasted but a few hours. Abdominal section was performed at once, and reduction of the intussusception effected within ten minutes of the beginning of the operation. The child made a good recovery. (iv. 1406.)

A female infant, aged 7 months, had been ailing for five weeks; for three days vomiting and other symptoms of intussusception had been present. On admission the child was very ill; the intussusception was seen protruding from the anus. The abdomen was immediately opened and the intussusception reduced. Considerable force had to be used to reduce the last few inches; the operation lasted twenty-five minutes. The child died seven and a half hours later. There was no post-mortem. (v. 942.)

A girl, aged 7½, had had vomiting, constipation and abdominal pain for three days. The pain, however, had not been severe. On admission the general condition was good, but the abdomen was distended and rigid in its lower half. In the right iliac fossa a firm swelling of the size and shape of a lemon could be felt. It was moveable and evidently within the abdomen. The abdomen was opened at once, and the tumour found to be an intussusception. Manipulation failed to reduce the intussusception, but caused rupture of its serous coat, so fifteen inches of intestine were resected and the ends joined by Murphy's button. In approximating the two halves of the button, however, a piece of mucous membrane was left protruding. The intussusception was of the ordinary ileo-cæcal variety. The child died ten hours later. The temperature and pulse had risen to 103° and 136 respectively before death. The post-mortem showed no signs of fæcal extravasation. (v. 1664.)

For Acute Enteritis.

A warehouseman, aged 21, who had previously been quite well, felt a sudden pain in the abdomen one afternoon, but continued his work that day. Next day the pain was much worse, and vomiting began; he stayed in bed two days, and on the fourth day came to the hospital very ill indeed. His bowels had acted until the day before admission. The abdomen was not distended; nothing could be felt in it. The abdomen was immediately opened, and more

than three feet of jejunum found deeply congested and almost gangrenous. A small band was seen and divided, but this was not considered to be the cause of the obstruction. No further operation was attempted, on account of the patient's desperately bad condition. Death occurred four hours later. At the post-mortem, acute enteritis was found involving forty inches of the upper part of the small intestine. The intestine was greatly thickened and inflamed, but there had been no constriction anywhere. There were several simple ulcers of the stomach. The case was clearly one of acute enteritis. (v. 2853.)

For Appendicitis.

The classification of the operations upon the vermiform appendix is the same as that adopted last year. All the cases in Table II. appear also in Table I. All operations, whether large or small, performed upon the appendix in either medical or surgical wards have for convenience been placed together in Table II., as was done last year and the year before.

The total number of operations upon the appendix has diminished from forty-three in 1896 to thirty-nine in 1897.

The cases of acute suppurative appendicitis treated by free incision into the general peritoneal cavity have diminished in number from twelve in 1896, with nine deaths, to nine in 1897, with seven deaths.

The cases of acute suppurative appendicitis treated (generally at a later date) by simple incision of the abscess through peritoneal adhesions have also diminished slightly from fifteen in 1896, with three deaths, to thirteen in 1897, with two deaths.

The cases of removal of the appendix for chronic appendicitis in a quiet interval have increased from eight in 1896 to thirteen in 1897; there were no deaths in either year.

I.—ACUTE APPENDICITIS WITHOUT EXTERNAL SUPPURATION.

Exploratory operation.

One case; recovery.

A girl, aged 16, was admitted on the third day of an attack of acute appendicitis. She walked to the hospital, and was found to have a tender swelling in the right iliac fossa and a temperature of 101.8° . On the following day, the temperature being then normal, the abdomen was opened over the swelling. Some congestion of the cæcum and neighbouring peritoneum was seen, but no pus. The appendix was not seen. A drainage tube was inserted, and two days later there was a slight discharge of pus from the wound. With the exception of a slight rise a few days after the operation, the temperature remained normal, and the patient made an excellent recovery. She left the hospital on the thirty-third day after the operation with the wound quite healed. (i. 1620.)

II.—ACUTE APPENDICITIS WITH SUPPURATION.

(a) *Free incision into the peritoneal cavity, removal of appendix, washing out and drainage.*

Two cases; one recovery.

A schoolboy, aged 14, was admitted with acute appendicitis. He had had one previous attack six months before, and had subsequently been in his usual good health until the morning of the day before admission, when he was suddenly seized with severe abdominal pain, collapse and vomiting. He was kept quiet and treated with opium. On admission he looked ill, the abdomen

was moderately distended, and there was considerable pain, especially in the *left* iliac fossa; no tumour could be felt. Seven hours later, or about thirty hours after the first onset of symptoms, the abdomen was freely opened in the right semi-lunar line and some pus found free in the abdomen. The appendix, which was perforated and contained two concretions, was removed, and the abdomen thoroughly washed out with 1 in 4,000 biniodide of mercury lotion followed by boracic lotion, and then drained. The operation was followed by vomiting and restlessness for a day or two, and then the boy made a rapid and excellent recovery, leaving the hospital on the forty-second day quite well. Several months later he was known to be in excellent health. (v. 3577*.)

An art student, aged 18, was admitted very ill with peritonitis, due to appendicitis. There was no history of any previous attack. Six days before admission he first complained of abdominal pain. Three days later he went for a long bicycle ride, and was much worse afterwards. Two days later, while sitting up in bed, he was suddenly seized with violent pain in the right iliac fossa and became collapsed. His temperature rose immediately to 101·2°. Next day he was brought to the hospital and an operation was immediately performed. On admission he was still much collapsed and very ill. His temperature was 99·5°. Pulse 102. The abdomen was tender, tense and rigid. The abdomen was opened in the right semi-lunar line, and pus and sticky lymph were found glueing the intestines together as far as could be seen through the wound. The peritoneal cavity was washed, sponged and drained as thoroughly as possible, and the perforated appendix, together with a loose faecal concretion, were removed. The operation lasted nearly two hours. The patient never recovered from the collapse, became very restless, and died three hours later. There was no post-mortem. (iii. 1628.)

(b) Free incision and washing out; no search for the appendix.

Five cases; no recoveries.

A married woman, aged 24, had had indigestion for three or four years and some constipation for about two years. Fifteen days before admission she was suddenly seized with pain all over the abdomen, and four days later became an in-patient, at another hospital, with a swelling in the right iliac fossa. She discharged herself a few days later with the swelling larger than before. On admission she looked ill, and had in the right iliac fossa a considerable tender swelling, apparently an abscess in connection with the appendix. On the following day an incision was made in the right semi-lunar line, and the general peritoneal cavity opened; distended bowel, but no pus, was seen. The wound was closed, and another incision made over the swelling. At first only distended and matted intestine were seen, but on passing the finger into the iliac fossa and breaking down adhesions, pus came welling up into the wound. An attempt was made to shut the pus off from the general peritoneal cavity by sponges, and the cavity was well washed out and drained. About five ounces of pus came away. The patient became much collapsed, and died on the following day. There was no post-mortem. (iv. 452.)

A man, aged 50, was admitted with a history of six weeks vague abdominal symptoms and constipation, and of five days acute obstruction. He walked to the hospital and did not seem very ill. A swelling could be felt in the right iliac region. The abdomen was at once opened in the middle line; the peritoneal cavity at first seemed healthy, but on passing the finger into the right iliac fossa, pus began to well up. The abdominal cavity was washed out and drained, a counter-incision being also made in the right iliac region. The patient did fairly well for about twenty-four hours, then grew rapidly worse, and died on the third day. The post-mortem showed a localised abscess around the appendix, which was perforated and had contained a concretion. The abdominal cavity contained a mixture of pus and lotion. (i. 674.)

A schoolboy, aged 12, who had had no previous illness, but who had complained of vague abdominal pain for "some time," was admitted on the

eleventh day of an attack of acute appendicitis. The illness had begun with sudden pain in the right iliac region, followed by constipation for nine days and occasional vomiting. A dose of castor oil then produced an action of the bowels. He continued to go about as usual until the day of admission, when pain again became very severe and vomiting became frequent. On admission there was a large swelling in the right iliac fossa and the whole abdomen was distended and tender. An incision was made into the swelling and pus let out; but as the abdominal swelling did not subside, a second incision was immediately made in the middle line and more pus let out. The whole abdomen was then washed out, but the boy died four hours later. No search was made for the appendix. The post-mortem showed a perforated appendix. (iii. 2113.)

A schoolboy, aged 11, was admitted on the fifth day of a first attack of acute appendicitis; the abdomen was distended and tympanitic; no tumour could be felt, but there was dulness and much tenderness in the right iliac fossa. On the day after admission an incision was made into the abdomen, and much foul pus let out from a localised cavity. The unobliterated portion of the peritoneal cavity was also opened, but immediately sewn up again. The abscess was washed out, and no search was made for the appendix. The temperature remained normal, and the patient did very well until thirteen days later, when he had a fresh attack of severe abdominal pain with distension and a rapid pulse. He was thought to have general peritonitis, so the abdomen was freely opened; a localised collection of pus was found, but the general peritoneal cavity was not infected; the abdominal cavity was washed out. The patient never rallied from the operation, and died in four hours with a rapidly-rising temperature. The post-mortem showed that the pus had become disseminated into the general peritoneal cavity, and had thus caused death by its absorption. (v. 458.)

A schoolboy, aged 9, was admitted on the twelfth day of a first attack of appendicitis. The abdomen was slightly distended, the temperature was 102° , and a definite swelling could be felt in the region of the appendix. An incision into the general peritoneal cavity showed healthy peritoneum; this wound was then closed and a puncture made into the swelling with a needle, and pus struck. A second incision was thereupon made over the swelling, behind and above the anterior superior iliac spine, and about four ounces of foul pus were let out. This wound was then thoroughly washed out. No search was made for the appendix. Rapid pulse, restlessness and abdominal distension quickly followed, and the patient died on the second day after the operation. The post-mortem showed that the incision into the abscess had also freely opened the healthy portion of the peritoneum. The peritoneal cavity contained much pus and lotion. (iii. 761.)

(c) *Free incision and drainage; no washing out; no search for the appendix.*

One case; death.

A man, aged 20, appeared to have had good health until four days before admission, when he began to vomit; his bowels were not opened after that day. Two days later severe abdominal pain set in. On admission the patient looked ill. Temperature was 99.6° . The abdomen during respiration moved only slightly, at the upper part. There was marked oedema over the whole of the lower part of the abdomen and some resistance on palpation, especially on the right side. An incision was immediately made into the abdomen parallel with Poupart's ligament, but beginning as high as an inch and a half above the level of the anterior superior spine. The general peritoneal cavity was opened, and after passing a probe down towards the pelvis some pus welled up. A drainage tube was inserted. No search was made for the appendix. After the operation the patient continued to vomit, the temperature rose rapidly, and death occurred next day. The post-mortem showed a large localised abscess in the pelvis and right iliac fossa, due to a perforated appendix which lay at the brim of the pelvis, and contained two faecal concretions. The incision into the

peritoneal cavity was wholly above the area of the abscess, which could have been opened through the adhesions only by an incision very low down in the abdomen. (v. 3545.)

(d) Free incision; local sponging without general washing out; no search for the appendix.

One case; recovery.

A schoolboy, aged 11, who had had a similar attack before, was suddenly seized, two days before admission, with severe abdominal pain, followed by vomiting and constipation. On admission the abdomen was tense, and moved slightly on respiration. There was resistance and dullness in the right iliac fossa. Temperature 103°; pulse 120. The abdomen was immediately opened by an incision near Poupart's ligament. The peritoneal cavity was opened and the cæcum presented; offensive pus was then seen to well up from the neighbourhood of the appendix into the peritoneal cavity; it was sponged away, no irrigation of the abdominal cavity being performed. No search was made for the appendix. For some hours the boy was very restless, and for a few days the abdomen was very tender. The temperature fell at once, and the boy made a good recovery. In this case there was a definite abscess cavity, which was opened during the operation. (i. 2696.)

(e) Limited incision through peritoneal adhesions; no removal of appendix.

Thirteen cases; eleven recoveries.

RECOVERIES.—A woman, aged 18, was transferred from a medical ward on the nineteenth day of an attack of acute appendicitis. A simple incision was made low down near Poupart's ligament, and much foul pus was let out. The wound was drained, and the patient made a slow but good recovery, leaving the hospital on the thirty-eighth day after the operation, and fifty-third after admission; the wound was almost healed. (i. 2642*.)

A woman, aged 19, was admitted on the fourth day of a first attack of appendicitis. The attacks began with severe pain all over the abdomen, vomiting and constipation. She stayed in bed from the beginning of the illness. On admission she looked ill; the temperature was 102°. The pain and swelling were chiefly on the right side of the abdomen, which was tender and distended. On the day of admission an incision was made just above and parallel to the outer part of Poupart's ligament, through peritoneal adhesions into a localised abscess cavity. The abscess cavity was drained, but not washed out; no attempt was made to find or remove the appendix. The temperature fell immediately, and the patient made an uninterrupted recovery, leaving the hospital forty-four days after the operation with a small sinus nearly healed. (ii. 259.)

A laundress, aged 50, was admitted on the ninth day of a first attack of acute appendicitis, which had begun with pain and vomiting; she had kept in bed for the last six days. On admission there was a well-defined swelling just above the outer half of Poupart's ligament. The temperature was normal. All acute symptoms had subsided. She was kept quiet in bed for another eight days, and the abscess was then opened by a small oblique incision just above the outer half of Poupart's ligament. A faecal concretion was removed with the pus, and the abscess cavity washed out. No attempt was made to interfere with the appendix or the adhesions. The patient made an uninterrupted recovery, and left the hospital twenty-nine days after the operation with the wound almost healed. (ii. 2895*.)

A woman, aged 53, had had for thirteen days abdominal pain, diarrhoea and occasional vomiting; she was then admitted to a medical ward, and eleven days later transferred to the surgeon; in the last few days she had had several slight rigors. An incision was at once made into a localised abscess; no search

was made for the appendix; the wound was drained. Convalescence was slow and complicated by melancholia. On the forty-third day the patient was discharged to an infirmary, the wound being not quite healed. The temperature was then about 101° or 102° every evening. (iv. 667.)

A schoolgirl, aged 5, was admitted with acute appendicitis of five days' duration. The patient was very ill. The abdomen was uniformly distended and tender; no definite lump could be felt in the iliac region. Pulse 120; temperature 99°. An incision was at once made in the semi-lunar line, and pus was found; no healthy peritoneum was seen. The abscess cavity was drained, but not washed out; no search was made for the appendix. The patient made a slow but excellent recovery, convalescence being delayed by some suppuration in the abdominal wall, which occurred a fortnight after the operation. The patient went to Swanley on the seventieth day after the operation in good health, and with the wound almost healed. (v. 169.)

A girl, aged 15, was admitted on the tenth day of an attack (apparently the first) of acute appendicitis. It had begun with vomiting and pain in the right iliac fossa. The abdomen was much distended, and a large inflammatory swelling extended nearly to the umbilicus and well to the left of the middle line. An incision near the right iliac spine did not strike pus, but a second incision nearer the middle line opened a large localised abscess. The cavity was drained, but not washed out. The patient made a slow but good recovery, leaving the hospital forty-three days after the operation, quite well and with the wound healed. At one time some faecal matter had come away with the pus. (v. 1426.)

A servant girl, aged 19, was admitted to a medical ward on the nineteenth day of an attack of appendicitis; the attack had begun acutely with sudden pain and vomiting; the latter symptom soon passed off, but local tenderness remained. She was kept in the medical ward for eleven days, and a swelling in the right iliac fossa gradually became more pronounced; the temperature was between 101° and 104°. The patient was then transferred to a surgical ward, and a incision internal to and a little above the anterior superior spine led to the evacuation of a very large quantity of foul pus from a localised intra-peritoneal abscess cavity. The cavity was washed out and drained for about three weeks. The patient made an excellent recovery, and left the hospital on the fortieth day after the operation with the wound healed. (v. 1558.)

A policeman, aged 24, was admitted about the fourteenth day of a first attack of acute appendicitis, which had begun with severe abdominal pain and vomiting. On admission the temperature was 100°; in the right iliac fossa was a large swelling, which when opened gave exit to a pint of foul pus. The operation was performed on the day of admission, and the incision was made through the peritoneal adhesions. No search was made for the appendix. The abscess was drained for many weeks. The patient made an uninterrupted recovery, and left the hospital on the eighty-fifth day, quite well and with the wound healed. (iv. 3553*.)

A carman, aged 54, was admitted within a few hours of the onset of a first attack of acute appendicitis which had begun with violent pain and vomiting. On admission the abdomen was distended, rigid and tender. He was kept quietly in bed for several days, and the signs of a localised abscess in the right iliac fossa gradually became more pronounced. On the seventh day an incision was made through peritoneal adhesions, and some very foul pus and a concretion were let out. The cavity was drained for several weeks. The patient made an excellent recovery, and left the hospital on the forty-third day after the operation, quite well and with the wound practically healed. The temperature after the operation was never above 99°. (i. 2379.)

A man, aged 18, was admitted with acute appendicitis of at least two days duration. An incision was at once made low down near Poupart's ligament

and a localised abscess containing about six drachms of pus was opened ; no search was made for the appendix. The cavity was washed out locally and drained, and the patient did well, leaving the hospital on the forty-third day. (v. 3039.)

A boy, aged 13, was admitted to a medical ward on the fifth day of an attack of acute appendicitis. He had had complete constipation, and vomited frequently. The abdomen was tense and tender, but no definite lump could be felt in it. On the third day after admission an incision was made through peritoneal adhesions into an abscess cavity, and about three ounces of foetid pus let out. He made a good recovery, and left the hospital seven weeks later. (ii. 2224, and Med. Register ii. 184.)

DEATHS.—A boy, aged 13, was admitted on the fourth day of an attack of appendicitis, which had begun acutely with sudden pain and vomiting. He was considerably collapsed, and the abdomen was distended and tender, especially in the right iliac region. Temperature 101·2°. An incision was at once made over the region of the appendix, and about three ounces of foul pus was let out directly the peritoneal cavity was opened. The abscess appeared to be a localised one, but with a track leading down into the pelvis. No search was made for the appendix, and there was no irrigation. The wound was drained. The temperature and pulse both rose, the boy became more and more restless, and died twelve hours later. The post-mortem showed that there had been old inflammation of the appendix, with the formation of a small abscess shut in by the great omentum ; that this had ruptured into the general peritoneal cavity (probably at the date of the onset of acute symptoms), but had subsequently been again localised by adhesions ; that this abscess had been opened at the operation ; that further extension of suppuration had taken place (probably just before the operation) in two directions : (1) along a narrow track running upwards towards the stomach ; (2) towards the pelvis. All the rest of the peritoneal cavity was healthy. (ii. 3116.)

A boy, aged 17, was transferred from a medical ward with acute appendicitis. Five days before admission to the medical ward he had had sudden abdominal pain and vomiting. Next day he took to his bed. In the next four days he had much pain, with occasional vomiting and a little diarrhoea. He was kept in the medical ward for two days. During this time his condition was fairly good ; the temperature was about 101° ; the abdomen was a good deal distended, but moving at the upper part. An operation was then performed, on the seventh day of the illness ; an incision an inch and a half long was made just above the outer part of Poupart's ligament and parallel with it, and a localised abscess containing two ounces of pus was opened ; a finger was introduced to explore the abscess, and the latter was washed out. The temperature and pulse both gradually rose, the patient became very restless, and died on the second day after the operation. The post-mortem showed ulceration of the appendix with a concretion. In opening the abscess a hole had accidentally been made through the adhesions into that part of the peritoneal cavity that had previously been healthy, and through this hole pus and lotion had been injected into the general peritoneal cavity, setting up general peritonitis. There were two prolongations of the original abscess, one towards the loin, the other towards the pelvis. (ii. 144.)

III.—CHRONIC APPENDICITIS WITH ABSCESS.

(a) *Free incision, removal of appendix, local sponging and drainage.*

Two cases ; no deaths.

A boy, aged 10, was admitted for abdominal pain. In the last five years he had had several attacks of vomiting and constipation. For the last three weeks he had had occasional vomiting and some abdominal pain. On admission

the temperature was 101.6°; pulse 104; and he had much pain in the right iliac fossa. The abdominal walls were rigid, but there was no abdominal swelling, local or general. He was kept quietly in bed, and by the third day the temperature had become normal, and it never rose again. On the sixteenth day after admission, when slight pain and tenderness in the right iliac fossa were the only symptoms, the abdomen was freely opened in the right semi-lunar line, and the appendix easily found and removed. In the course of the operation a localised abscess, containing perhaps an ounce of pus, was found. Sponges were packed around this, and the pus removed by *local* sponging and washing. The wound was drained, and the patient made an uninterrupted recovery, leaving the hospital on the thirty-fifth day after the operation. He was readmitted three months later, complaining again of pain. (iv. 1719.)

A girl, aged 14, had had a first attack of appendicitis ten weeks before admission. She stayed in bed for a fortnight, and was afterwards able to get about. Since that time she had had many slight attacks of pain, and for this she was admitted. A distinct tumour, as large as a hen's egg, could be felt in the right iliac fossa. There were no acute symptoms. The abdominal cavity was freely opened, and an abscess cavity containing two ounces of pus was found surrounding the adherent appendix; the latter was removed, and the pus removed by *local* sponging; there was no irrigation. The wound was drained by means of a tube and iodoform gauze. The patient made an uninterrupted recovery. At no time, either before or after the operation, was the temperature above 98.6°. (v. 2011.)

(b) Limited incision through adhesions; no search for the appendix.

One case; recovery.

A compositor, aged 21, was admitted with appendicitis and an abscess. For four weeks he had had pain, and for two weeks a swelling in the region of the appendix. He had had several previous attacks of appendicitis. On admission the temperature was normal. In the right groin was an obvious abscess with redness and œdema of the skin. The abscess was opened by simple incision and drained. The patient made a good recovery, and left the hospital on the thirty-fourth day with the sinus almost healed. (iv. 1762.)

IV. — CHRONIC RECURRENT APPENDICITIS WITHOUT EXTERNAL SUPPURATION.

Free incision, removal of appendix.

Thirteen cases; all recovered.

A boy, aged 15, had had three attacks in the last six months. The appendix was found to be much bound down by adhesions; the central part was removed; the tip could not be removed, and was left; a good recovery followed. (i. 2216.)

A man, aged 26, had had several attacks in the last ten years; there was no pus; a good recovery followed. (iv. 1175.)

A man, aged 27, had had four attacks in six months; he had phthisis; a good recovery followed. (v. 3244.)

A baker, aged 28, was admitted with chronic appendicitis; the first attack had begun two months before admission; three weeks after admission the appendix was removed; it was found surrounded by adhesions and a few drops of pus; it had evidently perforated on some previous occasion; the wound was drained for seven days, and a good recovery followed. (v. 890.)

A chemist, aged 28, had had five attacks in eighteen months ; the appendix was firmly bound down by adhesions ; the operation was long and difficult ; most of the small intestines were out of the abdomen at one stage of the operation ; a good recovery followed. (iii. 1431A.)

A bootlaster, aged 33, had had two attacks in six months ; the appendix was much bound down by adhesions ; there was no pus ; a good recovery followed. (i. 2262.)

A butler, aged 33, had had two attacks in the last few years ; no tumour could be felt ; the appendix was found to be slightly thickened ; there were no adhesions nor concretion nor suppuration. No drainage ; a good recovery followed. (i. 1364.)

A girl, aged 14, also made a good recovery ; she had had at least one previous attack, and had been in the hospital earlier in the year for the same complaint. (i. 2335.)

A laundress, aged 25, had had two previous attacks. The appendix was not obviously diseased, but was doubled on itself, and was therefore removed ; there were no adhesions ; nothing was found wrong with ovary or kidney ; a good recovery followed. (iv. 1878.)

A woman, aged 26, had had many attacks in four years ; the appendix was found thickened, and with a caseous mass in connection with it, evidently the remains of a former abscess ; a good recovery followed. (ii. 1772.)

A woman, aged 32, had had three attacks, the last two months before admission ; a few drops of pus were found near the appendix ; the wound was drained for forty-eight hours, and a good recovery followed. (v. 1078.)

A governess, aged 33, had had four attacks of appendicitis ; the appendix was thickened ; there was no adhesions and no pus. The great omentum was the seat of multilocular cystic disease, and was also removed at the same time. (See an account of this case by Mr. Harrison Cripps, in the Path. Soc. Transactions, 1897.) (ii. 408.)

In all these thirteen cases the appendix was removed in a quiet interval when there were no acute symptoms.

There were also two other cases which appear in the Statistical Tables under other headings, but which may be mentioned here.

One of these was a case in which the appendix was removed, although not diseased ; it is described under exploratory abdominal section, which was performed for acute peritonitis, thought to be due to appendicitis, but which was subsequently found to have been caused by the rupture of a suppurating cyst of the kidney. (i. 1874.)

The other case was one of acute appendicitis in which an exploratory extraperitoneal operation was performed, no pus being found. The case was in a medical ward, and appears in the Medical Statistics only, and not in Table II. The patient was a boy, aged 17, who was admitted on the third day of an attack of acute appendicitis. There was much pain and tenderness in the right iliac fossa, distension of the abdomen, and frequent vomiting. Temperature 101°. He was treated at first by rest, but on the following day he was worse, and the peritonitis was more marked, the abdominal wall being fixed and rigid ; an exploratory extraperitoneal incision was therefore made just above Poupart's ligament ; the peritoneal cavity was not opened. No evidence of suppuration was found, so the wound was simply closed up again. The symptoms gradually subsided, and the patient made a good recovery, leaving the hospital on the twenty-seventh day after the operation. (Medical Register i. 122.)

Enterotomy.—Three cases ; three deaths.

A market gardener, aged 30, had been quite well until seven months before admission, when he began to complain of pain in the abdomen, especially after meals, and lasting usually from a quarter of an hour to two hours. Vomiting and occasional diarrhoea then set in, but after careful dieting these symptoms subsided. In the last few weeks, however, they had all returned, and he had been worse than ever. On admission he was thin and pale; the abdomen was uniformly distended and tympanitic, and did not contain any fluid; below and around the umbilicus was some induration. Nothing could be felt per rectum, except some hardness and fixity of the tissue around it. The bowels were opened about once a day, but not very freely. On the sixth day after admission the abdomen was opened as for inguinal colotomy, first in the left, then in the right iliac region, but the sigmoid and cæcum were found to be so much bound down by adhesions that it was impossible to bring either of them up into the wound. A loop of small intestine was therefore drawn out and opened. The peritoneum was found studded everywhere with small flat, whitish nodules, which were thought to be either malignant or inflammatory. After the operation the patient continued to vomit frequently, gradually became weaker, and died on the second day after the operation. The post-mortem showed chronic simple peritonitis, with much thickening of the peritoneum and numerous old adhesions matting the intestines together. There was a well-marked fibrous stricture of the pylorus, which may have been the starting point of the peritonitis. No ulcer of the stomach or duodenum could, however, be found. (ii. 1412.)

A man, aged 78, had been quite well until two days before admission, when he was suddenly seized with acute abdominal pain and vomiting. The vomiting was frequent afterwards. There was no history of any previous attack. On admission nothing abnormal could be felt in the abdomen, and there was no distension. The symptoms of obstruction were, however, so urgent, that a few hours after admission the abdomen was opened in the middle line. The colon being undistended, and no cause of obstruction having been found, a loop of distended small intestine was stitched to the abdominal wall and opened. The vomiting continued; scarcely any faecal matter came away, and the patient died on the second day after the operation. The post-mortem showed old calcified mesenteric glands; the great omentum was rolled up with a cord as thick as a finger; the tip of this was firmly adherent to the calcified glands. The rest of the cord lay to the left of the mesentery, and constricted loosely the whole of the small intestines from a point five feet below the duodenum. The enterotomy wound was one foot above this point. There was neither perforation nor peritonitis. (iv. 988.)

A sempstress, aged 13, was brought to the hospital suffering from acute intestinal obstruction. Three months previously she had been in another hospital for three weeks with vomiting and diarrhoea, and was said to have had "typhoid fever." She afterwards remained well until three weeks before admission, when she had another attack lasting a week. On the day before admission a third attack commenced with severe abdominal pain, vomiting, and distension of the abdomen. She was at that time somewhat collapsed, but she improved a little by the following day, when she was admitted to a medical ward. Her condition then did not seem to demand any operation, but a few hours later she again became collapsed, and nearly pulseless with frequent vomiting. The abdomen was moderately distended, especially in the lower half, and coils of distended intestine could plainly be seen. The abdomen was immediately opened in the middle line; no pus or peritonitis were found, but the small intestines were greatly distended. The appendix seemed normal, and no cause for the obstruction could be found. A distended coil of intestine was therefore stitched to the abdominal wall and opened, but the patient died twenty minutes after the operation. The post-mortem showed that the case was one of strangulation of the ileum by old bands of

adhesion connected with old appendicitis. The appendix contained a faecal concretion lying in a small collection of pus, and surrounded by dense, and evidently very old, adhesions. (iii. 120.)

There were also two other cases of a woman, aged 41, and a man, aged 18, in which enterotomy was performed as part of an operation for strangulated femoral hernia and for appendicitis; they are fully described under herniotomy and abdominal section for appendicitis respectively. (iii. 283 and iii. 1628.) A sixth case is also described under exploratory abdominal section (p. 240) (v. 1546); all these cases ended fatally.

Enterectomy.—Six cases; two deaths.

Recoveries.—A chairmaker, aged 59, had been apparently well until one month before admission; since that date he had had abdominal pain and vomiting and increasing constipation; these symptoms increasing and distension setting in, inguinal colotomy was performed two days after admission. The sigmoid flexure, which had a carcinomatous stricture at its lower part, was drawn out of the wound and fixed there by sutures the growth being thus left outside the abdomen. The gut was opened at once; no glass rod was used. Eleven days later the gut was freed from the abdominal wall, and several inches of it were resected, including the colotomy opening and the growth. The divided ends were united by silk sutures, and dropped back into the abdomen. The peritoneal cavity was washed out and drained by a glass tube in the middle line, and a rubber tube in the other wound. On the fifth day the glass tube was withdrawn, and it was then found that it had broken, and that an inch or two of it remained in the pelvis, where it was subsequently felt. It was not deemed advisable to remove it, as it was not causing any trouble. In other respects the patient's recovery was good, and he left the hospital six weeks after the second operation with the wounds nearly healed. He was able to walk about, and complained of nothing but a little pain occasionally. (ii. 1333.)

A woman, aged 46, had had for two years a swelling in the right femoral region. Three months before admission the swelling burst, and a faecal fistula had existed ever since. Local operation having failed to cure the fistula, the abdomen was opened, and the fistula found to lead into the caecum, which was partially herniated into the femoral canal. A portion of the caecum was excised, and the wound sewn up. The patient made an excellent recovery, and left the hospital on the thirty-fourth day after the operation with the wound soundly healed. (iv. 2539.)

A woman, aged 44, who had been in the hospital some years previously with pelvic abscess, was admitted with a strangulated ventral hernia near the left anterior superior iliac spine. She was much exhausted by the frequent vomiting. Three inches of gangrenous small intestine were resected, and the cut ends united by simple silk sutures. The operation lasted two hours and twenty minutes. The patient made an excellent recovery, and left the hospital twenty-seven days later. (ii. 1376.)

The case of a woman, aged 56, who underwent enterectomy for a faecal fistula, which followed an abdominal section for intestinal obstruction, has been fully described under the latter heading (p. 222). (v. 1026.)

Deaths.—A boxmaker, aged 16, had had somewhat similar attacks eighteen and two months before admission; he had otherwise been in good health, and was at work when he was suddenly seized with acute abdominal pain and vomiting; three hours later he was admitted to a medical ward. He was still vomiting, and was considerably collapsed. Temperature 97.6°. The abdomen moved well, and nothing abnormal could be detected in it except a little tenderness and resistance in the right iliac fossa. The case was thought to be one of appendicitis. After a few hours rest in bed the symptoms subsided and he

seemed better, but on the following day he rapidly became much worse, and the abdomen became greatly distended. The abdomen was opened just twenty-four hours after the first onset of symptoms. A quantity of blood-stained fluid escaped, and thirty-six inches of small intestine were found tightly strangulated by a band, and perfectly black and gangrenous. Although the patient's condition was hopelessly bad, the gangrenous intestine was rapidly cut away, and the ends brought out at the external wound. The operation lasted about fifty minutes, and the patient died a few minutes later. The post-mortem showed old caseation of tuberculous mesenteric glands, with a band of adhesions that had strangulated the ileum for a very long time. The lumen of the ileum at the point of strangulation was very small indeed. There was, however, a fistulous opening between the duodenum and the ascending colon, which had acted as a safety valve, and prevented the earlier occurrence of intestinal obstruction. (iv. 964.)

A woman, aged 39, was admitted with a fæcal fistula. For six years she had had suppuration about the abdomen, following a blow and complicated by an ovarian tumour, removed at another hospital five years before admission. On admission she was in good condition, but with a fistula to the right of and below the umbilicus. The abdomen was freely opened, several inches of adherent small intestine removed, and the ends joined by a Murphy's button. The patient died three days later of peritonitis, which appeared to have been caused, not by any leakage at the seat of resection, but by infection at the time of the prolonged and complicated operation. The button held the ends of intestine quite firmly. (v. 1963.)

Another case of a woman, aged 41, who underwent herniotomy, enterectomy and enterotomy, has already been described, and appears in the Statistics, under herniotomy for femoral hernia (p. 209). (iii. 283.)

For Replacement of prolapsed viscera after colotomy.—One case ; death.

This case has already been fully described under colotomy (p. 213). (ii. 2939.)

For Erasion of tuberculous mesenteric gland.—One case ; recovery.

A boy, aged 6, had for one year been passing blood with his motions, and had been emaciating. In the right iliac fossa could be felt with ease an irregular rounded freely movable swelling, as large as a walnut. Opinions were divided between adenoma of the intestine, chronic intussusception, and tuberculous mesenteric gland. The abdomen was opened over the tumour, which proved to be a mass of caseating tuberculous glands in the mesentery, close to the lowest part of the ileum. This was scraped, and the edges of the wound in the mesentery were fixed to the abdominal wall. The cavity was allowed to granulate up, and the child made a good recovery, leaving the hospital on the thirty-eighth day. (v. 1845.)

For Hæmorrhage after radical cure of hernia.—Two cases ; two recoveries.

The patients were males, aged 23 and 46, with inguinal hernia ; in the one case the operation for hæmorrhage was performed on the third day, after that for hernia ; in the other it was performed during the course of the latter operation ; both cases have already been described under radical cure of hernia (p. 211). (v. 697 and iii. 82.)

For Hæmorrhage into lesser peritoneal sac.

A gardener, aged 50, was admitted on account of a large abdominal tumour. Six months previously he had strained himself while carrying a ladder, and

was for some hours in much pain, although able to continue his work. Twenty-four hours later, while coughing, he first noticed the swelling in the left hypochondrium. For a week he was seriously ill with symptoms of intestinal obstruction. Three weeks later he had thrombosis of the veins of both legs. The tumour when first noticed was nearly as large as on admission. On admission the patient appeared to be in good health. Occupying the whole of the upper and left quarter of the abdomen was a prominent rounded elastic swelling, neither painful nor tender. It moved with respiration, and appeared to be a hæmatoma of the lesser peritoneal sac. Three weeks after admission, as the tumour was supposed to be increasing in size, the abdomen was opened in the middle line above the umbilicus, a cyst opened and eight pints of dark greenish-brown alkaline fluid let out; this contained altered blood but no bile. The cyst wall was sewn to the abdominal parietis and the cyst drained. The cyst was in the lesser peritoneal cavity. Two days after the operation, food was found to be passing through the fistulous opening. This continued for several days, and the patient appeared to be losing ground. Firm bandaging of the abdomen, however, caused the fistula to heal, and the patient left the hospital on the thirty-second day after the operation with the wound almost closed. When seen again two months later, he was perfectly well and had resumed his work. (i. 2731.)

For Insertion of wire into an aortic aneurism.—One case; recovery.

A laundress, aged 35, had had a pulsatile moveable swelling in the upper part of the abdomen for six months. It had been slowly increasing in size. On admission it appeared to be as big as a hen's egg, and could be moved laterally for about two inches on either side. The abdomen was opened, and the aneurism found to spring from the front of the abdominal aorta, near the celiac axis. It had a wide base. Five feet of fine silver wire and a piece of silkworm gut were then inserted into the aneurism through a canula, and the opening closed with a ligature. The patient did extremely well, and the temperature remained normal until the twenty-fifth day, when it suddenly rose to 104°, with a rigor. After this the temperature remained about 102° for three days, and then the patient insisted on going home. When seen at home a month later, the aneurism appeared to have consolidated, and the patient's general health was good. No cause for the elevation of temperature was discovered. Nearly a year after the operation she was again seen and found to be well. (iii. 827.)

For Rupture of bladder.—Two cases; two deaths.

A man, aged 41, who for about five weeks had had much difficulty in passing water, was admitted with complete retention, and in great pain, having passed no water for twenty-six hours. Catheters had been passed before the patient came to the hospital, but no urine came away. Under an anæsthetic a little urine was passed synchronously with respiration. The abdomen was opened and the bladder found to be much sacculated. One of the sacculi had ruptured, partly inside and partly outside the peritoneum, and there was urine in the peritoneal cavity. The patient never rallied from the operation, and died thirty hours later. There was no post-mortem. (i. 2217.)

The other case, in which the bladder was ruptured during lithotrity, has already been described under the latter heading. (v. 1326.)

Hysterectomy.

ABDOMINAL hysterectomy for fibroid was performed ten times, with one death.

The fatal case was that of a woman, aged 37, admitted with a tumour extending nearly up to the umbilicus. The uterus was removed without difficulty, and the stump was cauterised and dropped back into the abdomen, the peritoneum having been sewn over it. The patient became restless, the

pulse rose and became very weak, and she died on the second day. The post-mortem showed peritonitis, the pelvic peritoneum being intensely congested, and containing a good deal of thick yellow dirty-looking pus. The stump itself looked well, and had evidently not been the source of infection. (Martha 139.)

The nine successful cases were those of women, aged 30, 48, 36, 29, 30, 50, 24, 37, 42. (See Martha notes, Nos. 17, 35A, 86, 88, 89, 102, 309, 321, 353.)

VAGINAL hysterectomy for carcinoma.—There was one death; the woman was aged 54, and had an epithelioma extending as high up as the internal os. The patient died of peritonitis two days later. At the post-mortem the kidneys were found to be much destroyed by chronic inflammation. The whole of the primary malignant disease had been removed, and there were no secondary growths in glands or elsewhere. (Martha 5.)

Hysteropexy.—Performed once with partial success upon a woman, aged 56, for procidentia. She was readmitted a few months later and underwent a second operation, described under exploratory abdominal section. (Martha 43A.)

Removal of uterine fibroid.

This was the case of a woman, aged 34, who had a large fibroid with a pedicle one inch in diameter; this was transfixed, tied, and treated intra-peritoneally. The patient seemed to do well for three days, then suddenly became restless and faint. The temperature ran up to 103°, and she died on the fourth day. The post-mortem showed a good deal of blood-stained fluid in the peritoneal cavity, but no definite evidence of peritonitis. (Martha 131.)

Removal of uterine appendages.

A married woman, aged 26, had had pelvic inflammation on and off for two years, and was losing flesh; a pyosalpinx as large as an orange was removed, but the temperature rose steadily after the operation, and the patient died two days later. The post-mortem showed an opening into the upper part of the rectum; there was also lardaceous disease of the viscera. (Martha 261.)

For **Extra-uterine gestation.**—Three cases; one death.

The two successful cases were women, aged 37 and 24; in each case the pregnancy was of about three and a half months.

The fatal case was that of a woman, aged 34, at a somewhat earlier period of gestation (probably about two months). There was a large quantity of clot in the abdomen, but no very recent blood. After the operation the patient vomited frequently, and died on the third day of peritonitis. The post-mortem also showed a good deal of blood in the pelvis. (Martha 90.)

Oophorectomy.

A married woman, aged 37, who had never had children, was admitted for severe dysmenorrhœa, which had lasted many years, and had resisted all mild forms of treatment. Double oophorectomy was performed; one ovary was found cystic, and on the other side there was a small uterine fibroid adherent to the ovary. There were numerous dense adhesions, which made the operation very difficult. The patient made an excellent recovery, and was relieved of her pain.

Ovariectomy.

For **INNOCENT TUMOUR.**—Thirty-five cases; two deaths.

RECOVERIES.—Three cases were of dermoids of the ovary in women, aged 45, 28 and 30 (Martha 163, 201, 202); in one case of a woman, aged 58, there was also an old calcified hydatid of the abdominal wall, which was removed at the same time as the ovarian cyst (v. 311); in one case of a woman, aged 30, the tumour was a hydatid, containing numerous daughter cysts; it was drained through the posterior fornix (Martha 117); the other twenty-eight cases presented no points of any special interest. (i. 817, ii. 1359, iii. 1150, 1320, 1720, iv. 463, 2403, v. 2226, and Martha 11, 21, 59, 74, 125, 132, 137, 160, 168, 170, 173, 204, 263, 275, 284, 324, 369, 370, 371, 373.)

DEATHS.—A woman, aged 53, was admitted with a large ovarian tumour and some uterine hæmorrhage. The operation was completed in less than half an hour, and presented no unusual difficulty. The patient did well for two days, then suddenly became collapsed, and died a few hours later; the temperature rose to 103°. The post-mortem showed no very obvious cause of death. (Martha 81.)

A woman, aged 24, had a cystic tumour as large as a cricket ball firmly fixed in the pelvis, and containing some foul pus; the operation was long and difficult, and the patient afterwards became restless, and died on the day after the operation; the temperature had risen to 103°; the exact nature of the cyst was never clearly ascertained, but it was believed to be ovarian. (Martha 364.)

For MALIGNANT TUMOUR.—Two cases; one death.

A woman, aged 23, after removal of a tumour, at first thought to be innocent, but subsequently proved microscopically to be malignant, made a good recovery from the operation, and left the hospital four weeks after admission; she died at home some months later. (v. 1378.)

A woman, aged 53, was admitted very ill with a very large ovarian tumour and cedema of the legs. Twelve days after admission the tumour was removed with great difficulty, on account of numerous adhesions and much chronic peritonitis. After the operation the temperature remained normal, but the abdomen soon began to swell again, the patient emaciated rapidly, and died on the thirty-second day after the operation. The post-mortem showed numerous colloid masses in various parts of the peritoneum. (i. 1587.)

Exploratory Abdominal Section.

For Calculus in the Ureter.—A girl, aged 11, was admitted on account of renal pain and occasional hæmaturia; these symptoms had lasted two years. No enlargement of the kidney could be detected. On the day after admission a severe attack of pain occurred. Ten days later the kidney was explored from the loin and found to be slightly dilated, but otherwise normal; no stone could be found. The wound healed. Three weeks after the first operation another severe attack of colic occurred, so an exploratory abdominal section was performed, and a stone felt in the right ureter close to the bladder. The wound was closed, it being intended to remove the stone subsequently by supra-pubic cystotomy. The lumbar wound was re-opened and drained. The patient died three days later of peritonitis, which was found at the post-mortem to have been caused by a communication accidentally made between the lumbar wound and the peritoneal cavity. The stone in the ureter was three-quarters of an inch long. The opposite kidney was somewhat hypertrophied, but was otherwise quite normal. (v. 423.)

For Contusion of Abdomen.

A coal porter, aged 22, was admitted for a contusion of the abdomen, the wheel of a heavy van having passed across the abdomen. He was somewhat collapsed, and in much pain. The abdomen was at first flat, and the muscles

moved well. Abdominal distension, however, soon set in, the pulse rose to 132, vomiting occurred, and the liver dulness, at first normal, became apparently absent. Five and a half hours after the accident an exploratory laparotomy was performed, the abdomen being opened below the umbilicus. Blood, apparently venous, escaped, but no gas. Nothing more was done, the wound being closed without drainage. For about a fortnight the patient was very ill, with a temperature from 101° to 102° , a pulse of about 100, and much thirst and vomiting. He then rapidly improved. The bowels were opened for the first time on the third day, some old blood clot being passed with the motions. Convalescence was complicated by orchitis and thrombosis of the iliac vein, but the patient made an excellent recovery, and left the hospital quite well on the seventy-second day after admission. (v. 1187.)

For Intestinal Obstruction.—Three cases ; three deaths.

A woman, aged 50, was admitted with symptoms of intestinal obstruction. Constipation had been present for fourteen days or more, complete obstruction with vomiting and abdominal pain for about five days. The abdomen was opened and the intestines examined. No definite cause of obstruction could be found, but a tumour could be felt deep down in the pelvis. The patient seemed to do well for a few days, then got rapidly worse, and died on the fifth day. The post-mortem showed old adhesions in the pelvis, probably due to old suppuration about the Fallopian tubes. This had led to adhesions and partial obstruction of the ileum. No further operation could well have relieved the obstruction. (i. 677.)

A milkman, aged 36, was admitted emaciated and ill with chronic peritonitis and a history of three months' vomiting, abdominal pain and constipation. Some hard masses, thought to be new growth, could be felt behind the rectum and near the umbilicus. There was much free fluid in the abdomen, and some distension. A month after admission an exploratory abdominal section was performed in the left groin as for colotomy, but the sigmoid flexure was found so bound down that it could not be brought up to the wound. As the distension was not great the wound was simply closed. The patient gradually sank, and died a month later. The post-mortem showed a large simple chronic ulcer of the stomach which had eroded all the coats of the stomach. The edges of the ulcer had, however, undergone a remarkable spontaneous inversion, the neighbouring portions of the serous coat being firmly united over the base of the ulcer. Chronic peritonitis had caused much narrowing of the rectum and transverse and descending colon. (i. 862.)

A boy, aged 14, who had had many previous attacks of "biliousness," was suddenly seized, two days before admission, with violent pain all over the abdomen, followed quickly by vomiting, which occurred frequently, especially after attempting to take food. On admission he was in great pain, the abdomen was greatly distended and tender all over. Pulse 140 ; temperature 98.6° . The case was thought to be probably one of appendicitis. An incision was made over the cæcum, which was found distended and inflamed. Pus began to ooze up. As the patient was very ill, and nearly died on the table, nothing more was done than the insertion of a drainage tube. On the following day he seemed much better, but the temperature then rose rapidly, vomiting began again, and death occurred two days after the operation. At the post-mortem it was found that the appendix was quite healthy ; that there was a Meckel's diverticulum two inches long springing from a point ten inches above the ileo-cæcal valve and adherent by its tip to the mesentery, thus causing chronic strangulation of eight inches of small intestine, and narrowing it to a diameter of one-third of an inch. The strangulated intestine was greatly congested, and the tip of the diverticulum had perforated and set up a localised abscess which in its turn had caused general peritonitis. The diverticulum had behaved in much the same way as an appendix in a case of acute appendicitis. (ii. 1757.)

For Malignant Disease.—Fourteen cases ; four deaths.

RECOVERIES.—A man, aged 53, had had for seven months dyspepsia and occasional vomiting, and for two months had noticed a swelling in the upper part of the abdomen. The tumour was situated just below the edge of the liver and to the right of the middle line ; it was hard, rounded, and about two inches in diameter. It was singularly moveable laterally, and could be pushed entirely to the left of the middle line. Much doubt was expressed as to its nature. When the abdomen was opened it was found to be a spherical mass of new growth hanging in a pear-shaped manner from the edge of the liver. It was probably secondary to disease of the pylorus. There were other smaller nodules in the liver. Removal was impossible. The patient left the hospital a fortnight later. (i. 1818.)

A labourer, aged 26, had had for one year pain in the abdomen and for two months had been aware of a lump in the abdomen. The lump was found to be a mass of malignant disease behind the sigmoid flexure. Removal was impossible. The patient left the hospital five weeks after the operation. (ii. 329.)

A labourer, aged 30, had suffered for six months from loss of flesh, abdominal pain and diarrhoea. In the lower and right side of the abdomen was a hard rounded mass as large as a man's fist. It was believed to be malignant disease, and an exploratory operation confirmed the diagnosis. The growth was in the ascending colon just above the cæcum, and although the primary growth itself could have been removed, the presence of a chain of enlarged glands at the back of the abdomen contra-indicated any further operation. The patient left the hospital three weeks later. (ii. 1683.)

A tailor, aged 54, was admitted on account of an abdominal tumour and vomiting, both of two months' duration. He had also been losing flesh and was constipated. Just below the liver and slightly to the right of the middle line was a hard nodular mass as big as a man's fist. It was well-defined and not particularly tender. An exploratory abdominal section showed it to be malignant and irremovable ; its exact origin was not clearly ascertained ; it was certainly attached to the under-surface of the liver, and was believed not to be in the pylorus. The patient rapidly recovered from the operation, and left the hospital three weeks later. When seen again, seven months later, and examined at "consultations" by many of the surgeons, no trace of the tumour could be found, and the man seemed to be in good health. A few months later still, however, he was seen in another hospital suffering from jaundice and emaciation, and there was then but little doubt that he had malignant disease, probably in or near the head of the pancreas. The large hard tumour that had originally been felt and seen was probably mainly inflammatory. (ii. 1831.)

A woman, aged 47, was admitted on account of a lump in the right iliac fossa and diarrhoea of one year's duration ; there was no obstruction. Abdominal section showed an irremovable mass of carcinoma of the colon ; the patient left the hospital three weeks later. (ii. 1618.)

A woman, aged 59, who had suffered for several months from pain and other abdominal symptoms, was found to have a large irremovable mass of malignant disease springing from either the ovary or the cæcum. There were numerous secondary growths in the peritoneum. She left the hospital three weeks later. (ii. 1736.)

A woman, aged 35, who had undergone ovariectomy a year previously, was found to have extensive secondary deposits of colloid carcinoma about the peritoneum and elsewhere. She left the hospital three weeks after the exploratory operation. (iii. 1486.)

Two women, aged 66 and 49, recovered after exploratory operations which revealed retro-peritoneal sarcoma and malignant disease of the pelvic viscera respectively. (Martha 45 and 271.)

The case of the woman, aged 43, with malignant disease of the mesentery, has already been described under nephrotomy, which was also performed. (p. 200). (iii. 2851*.)

DEATHS.—A railway servant, aged 17, had been quite well until four weeks before admission, when he had a severe attack of diarrhoea, followed a week later by abdominal swelling. On admission he was thin and looked ill. Occupying the middle of the abdomen was a large hard immovable, rounded and somewhat irregular mass. The diagnosis lay between malignant disease and, possibly, hydatid. An exploratory operation showed a huge mass of sarcoma in the mesentery and retro-peritoneal tissues, and involving also the intestines. A small piece examined microscopically proved to be round-celled sarcoma. The patient gradually sank, and died a few weeks after the operation. The post-mortem showed secondary growths in the various parts of the abdomen. (i. 1819.)

A man, aged 76, was sent to the hospital as a case of strangulated hernia. For three years he had had a swelling in the groin, for six months constipation, and for a week abdominal distension and obstruction, but without vomiting. A large mass of malignant disease could be felt in the abdomen. An exploratory incision in the scrotum showed a sarcoma of the testis, which was removed. The abdomen was also opened, but as no definite obstruction could be found, the cæcum was merely brought up to the surface and fastened there without being opened. The patient, who was very ill before the operation, gradually sank and died two days later. The post-mortem showed that the only secondary growths were in the lumbar glands. (v. 836.)

A woman, aged 63, had suffered from chronic constipation for five years. In the last three weeks she had had only three slight actions of the bowels, and had vomited several times. On admission the abdomen was considerably distended and the uterus was found to be fixed; nothing else could be felt. The general condition was fairly good. On the day after admission an incision as for inguinal colotomy was made, but as the sigmoid appeared not to be distended the wound was closed again, and the abdomen opened in the middle line. A coil of slightly distended small intestine was opened. The patient became very bad during the operation, and died five hours later. The post-mortem showed a small carcinomatous ulcer at the lowest part of the sigmoid flexure. The latter was considerably hypertrophied, but not much distended. (v. 1546.)

A woman, aged 49, was admitted very ill with a large ovarian tumour; for two months she had been feeling unwell, for one month she had noticed the abdominal swelling, and for ten days she had had nausea. The abdomen was opened and twelve pints of clear fluid evacuated from the peritoneal cavity. The ovarian tumour, which was obviously malignant, was too much fixed to the bladder and uterus to permit of its removal. There were also numerous secondary growths in the peritoneum. After the operation the temperature rose steadily but slowly, vomiting and then delirium set in, and the patient died on the twelfth day after the operation. There was no post-mortem. (iii. 2151.)

For Procidentia Uteri.—The woman upon whom hysteropexy had been performed some months previously for procidentia uteri was readmitted for the same condition. An exploratory abdominal section showed the fundus of the uterus to be still fixed to the peritoneum of the anterior abdominal wall. The patient recovered from the operation. (Martha 43B.)

For Pyo-nephrosis.—Two cases ; two recoveries.

A dressmaker, aged 22, had suffered for three years with frequent attacks of severe pain in the right iliac fossa, the attacks lately occurring about every ten days, and being accompanied by vomiting. Six weeks before admission a swelling in the right iliac region had been discovered. For two weeks the urine had been turbid. On admission the patient looked thin and ill. In the right iliac and lumbar regions was a swelling as large as a cocoanut ; its lowest border was not lower than the level of the anterior superior spine of the ilium. At consultations there was much difference of opinion as to the nature of the tumour ; the majority favoured appendicitis. An exploratory abdominal incision showed it, however, to be renal. It was then opened from the loin, and about eight ounces of foul pus were let out ; no calculus was found ; the disease was believed to be tuberculous. The temperature, which before the operation had been persistently high, fell at once to normal, and remained there. The patient made an excellent recovery, and left the hospital on the thirty-seventh day after the operation with the wound healed. The kidney was still considerably enlarged, but painless. (v. 2960*.)

A man, aged 39, was transferred from a medical ward on account of pyuria. Four years previously he had passed blood in the urine, and since that time had had occasional pain in the loin. Recently there had been more hæmaturia and more pain. He had never passed gravel or a stone. On admission there was much pyuria, but no renal tumour could be felt. An exploratory laparotomy was performed, but no kidney could be discovered in the right loin ; the left was of normal size and seemed healthy. The cæcum and appendix were somewhat higher in the abdomen than was natural, and it was supposed that the right kidney was situated in some abnormal situation in which it could not be felt. The patient left the hospital seventeen days later, having lost the pain, but not the pyuria. A few months later he was readmitted with the same symptoms as before ; on this occasion a lumbar nephrotomy was performed, and a pyo-nephrotic kidney was found in its usual place, although small and surrounded by a good deal of chronic inflammation. (ii. 1669.)

For Supposed enlargement of gall bladder.

This case has already been described on p. 199 under nephrotomy for hydro-nephrosis. (v. 1072.)

For Suppurating cyst of the kidney.

A salesman, aged 27, was admitted to a medical ward on account of peritonitis, supposed to be due to acute appendicitis. For one week he had complained of abdominal pain and loss of appetite. Four days before admission violent pain and vomiting began, and lasted until admission. On admission the abdomen was somewhat distended and moving slightly. The pain was chiefly in the right iliac fossa and right side of the abdomen. No tumour could be felt. The temperature was 101° ; pulse 116. Next day the temperature was 98·6°, but as the patient was in other respects no better, he was transferred to a surgical ward and immediately operated upon. A condition of general peritonitis was found. The appendix was removed, but found to be quite healthy. The patient died collapsed a few hours later. The post-mortem showed a simple cyst in each kidney. That in the right side was as large as an orange, and had suppurated. This suppurating cyst had recently burst and set up peritonitis, at first localised to the right side of the abdomen, and afterwards becoming general. The appendix had nothing to do with the peritonitis. (i. 1874.)

For Supposed ovarian tumour.

An unmarried woman, aged 44, was admitted on account of pain and abdominal swelling. The latter had been noticed for a fortnight only, but she had had pelvic pain for about two years. Examination showed a large hard mass filling up most of the pelvis (a fibroid), and a large elastic, slightly tender mesial abdominal tumour, extending upwards to a point midway between the umbilicus and sternum. The cervix was high up against the middle of the symphysis. The diagnosis was inflamed ovarian cyst. When the abdomen was opened, the abdominal tumour was found to be a greatly distended bladder pushed up by an interstitial uterine fibroid. Forty-four ounces of urine were drawn off by a catheter, and the wound was simply closed up again. The patient gradually became weaker and weaker, passed very little urine, and eventually died nineteen days after the operation, the wound having run a normal aseptic course, and the temperature remaining normal until the day before death. The post-mortem showed no peritonitis nor any definite cause for death, except a slight degree of chronic interstitial nephritis. The fibroid was about as large as a cricket ball. (Martha 14.)



SUB-TABLE, SHOWING THE NUMBER OF CASES OF ERYSIPELAS, PYÆMIA, &c.,
IN THE SURGICAL WARDS.

DISEASES.	Under 5.		5-10.		10-20.		20-30.		30-40.		40-50.		50-60.		60-70.		70-80.		TOTAL.		Deaths.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
CUTANEOUS ERYSIPELAS—																						
Admissions	...	...	...	...	...	3	1	...	1	...	1	...	...	...	...	...	1	...	3	5	...	...
Occurring in Hospital	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Occurring after operation	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PHLEGMONOUS ERYSIPELAS AND CELLULITIS—																						
Admissions	1	4	...	...	...	5	2	1	1	...	...	...	2	...	2	1	...	18	7	...	...	...
Occurring in Hospital	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Occurring after operation	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PYÆMIA AND SEPTICÆMIA—																						
Admissions	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	3	...	...
Occurring in Hospital	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Occurring after operation	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DELIRIUM TREMENS—																						
Admissions	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Occurring in Hospital	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Occurring after operation	...	...	...	...	...	1	...	...	...	...	...	...	2	...	1	...	...	7	2	...	...	...

APPENDIX TO SUB-TABLE OF CASES OF ERYSIPELAS, PYÆMIA, &c.

ERYSIPELAS.—Cutaneous.

Admissions.

Of eight patients, none died.

Occurring in Hospital.

The only case was that of a man, aged 29, admitted for malignant disease of the lung and abdomen, who developed a mild attack of facial erysipelas and soon died, chiefly of the malignant disease. (iii. 3463.)

Occurring after Operation.

There were no cases during the year.

Phlegmonous.

Admissions.

Of twenty-five patients, none died.

Occurring in Hospital.

Two men, aged 30 and 60, admitted for wound of the hand and compound fracture of the pelvis, developed cellulitis of the arm and leg respectively, but made good recoveries.

Occurring after Operation.

There were no cases.

PYÆMIA AND SEPTICÆMIA.

Admissions.

One male and four female patients were admitted ; of these, one male and three females died.

A man, aged 67, admitted with pyæmia following suppuration about the elbow, died six days later ; there was no post-mortem. (v. 1130.)

A woman, aged 42, was admitted in a moribund condition, and died next day ; she had septicæmia, a facial carbuncle and a gangrenous condition of the lower lip ; all this had followed a scratch from a baby's toe six weeks before ; the post-mortem showed double septic pleurisy. (ii. 1476.)

A female infant, aged 7 months, who had been ill for seven weeks, was admitted very ill with abscesses in various parts of the body, and evidently the subject of pyæmia ; she died six days later, and the post-mortem showed renal thrombosis, double pleurisy and pulmonary infarcts. (iv. 2479.)

Occurring in Hospital.

The case of a woman, aged 20, admitted for a compound fracture of the femur, and who died of septicæmia nine days later, has been described under amputation of the thigh. (v. 1866.)

DELIRIUM TREMENS.

Admissions.

There were no cases with actual symptoms of delirium tremens at the time of admission.

Occurring in Hospital.

Seven patients showed symptoms of the disease soon after admission. Five of them were admitted for fractures. All recovered.

Occurring after Operation.

Two men, aged 29 and 71, developed symptoms after an operation for the radical cure of femoral hernia and a herniotomy for strangulated inguinal hernia respectively. Both made good recoveries.



TABLE OF AMPUTATIONS, WITH THE PERCENTAGE OF DEATHS DURING THE TEN YEARS
from 1888 to 1897 inclusive.

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of		Average Per-centage of Deaths.
																					Case.	Deaths.	
	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.			
PRIMARY—																							
Thigh ...	2	2	2	1	2	1	1	...	1	...	...	50*	100	100	50	...	...	...	...	...	12	5	41·66
Knee-Joint ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Leg ...	2	1	1	2	3	2	...	...	4	...	50	...	...	...	...	...	...	...	...	...	15	1	6·66
Ankle-Joint ...	...	...	1	1	...	...	...	...	...	...	...	...	100	...	...	...	...	...	...	...	2	1	50·00
Shoulder-Joint ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arm ...	...	2	1	6	...	1	1	...	2	2	...	50	100	...	...	...	...	...	...	...	15	2	13·33
Forearm ...	4	1	...	...	2	3	...	...	1	2	...	...	...	...	50	33·33	...	...	...	...	15	2	13·33
SECONDARY—																							
Thigh ...	4	1	3	...	...	2	1	2	...	...	25	100	33·33	...	...	...	...	100	...	...	16	7	43·75
Leg ...	1	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...
Arm ...	1	1	...	1	1	1	100	5	1	20·00
Forearm ...	2	2	1	5
Shoulder-Joint	1

* Foot also amputated.

* *Foot also amputated.*

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TO REGISTER OF POST-MORTEM EXAMINATIONS.

SURGICAL, 1897.

BY THE SURGICAL REGISTRAR.

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For Pyo-nephrosis.—Two cases ; two recoveries.

A dressmaker, aged 22, had suffered for three years with frequent attacks of severe pain in the right iliac fossa, the attacks lately occurring about every ten days, and being accompanied by vomiting. Six weeks before admission a swelling in the right iliac region had been discovered. For two weeks the urine had been turbid. On admission the patient looked thin and ill. In the right iliac and lumbar regions was a swelling as large as a cocoanut ; its lowest border was not lower than the level of the anterior superior spine of the ilium. At consultations there was much difference of opinion as to the nature of the tumour ; the majority favoured appendicitis. An exploratory abdominal incision showed it, however, to be renal. It was then opened from the loin, and about eight ounces of foul pus were let out ; no calculus was found ; the disease was believed to be tuberculous. The temperature, which before the operation had been persistently high, fell at once to normal, and remained there. The patient made an excellent recovery, and left the hospital on the thirty-seventh day after the operation with the wound healed. The kidney was still considerably enlarged, but painless. (v. 2960*.)

A man, aged 39, was transferred from a medical ward on account of pyuria. Four years previously he had passed blood in the urine, and since that time had had occasional pain in the loin. Recently there had been more hæmaturia and more pain. He had never passed gravel or a stone. On admission there was much pyuria, but no renal tumour could be felt. An exploratory laparotomy was performed, but no kidney could be discovered in the right loin ; the left was of normal size and seemed healthy. The cæcum and appendix were somewhat higher in the abdomen than was natural, and it was supposed that the right kidney was situated in some abnormal situation in which it could not be felt. The patient left the hospital seventeen days later, having lost the pain, but not the pyuria. A few months later he was readmitted with the same symptoms as before ; on this occasion a lumbar nephrotomy was performed, and a pyo-nephrotic kidney was found in its usual place, although small and surrounded by a good deal of chronic inflammation. (ii. 1669.)

For Supposed enlargement of gall bladder.

This case has already been described on p. 199 under nephrotomy for hydro-nephrosis. (v. 1072.)

For Suppurating cyst of the kidney.

A salesman, aged 27, was admitted to a medical ward on account of peritonitis, supposed to be due to acute appendicitis. For one week he had complained of abdominal pain and loss of appetite. Four days before admission violent pain and vomiting began, and lasted until admission. On admission the abdomen was somewhat distended and moving slightly. The pain was chiefly in the right iliac fossa and right side of the abdomen. No tumour could be felt. The temperature was 101° ; pulse 116. Next day the temperature was 98·6°, but as the patient was in other respects no better, he was transferred to a surgical ward and immediately operated upon. A condition of general peritonitis was found. The appendix was removed, but found to be quite healthy. The patient died collapsed a few hours later. The post-mortem showed a simple cyst in each kidney. That in the right side was as large as an orange, and had suppurated. This suppurating cyst had recently burst and set up peritonitis, at first localised to the right side of the abdomen, and afterwards becoming general. The appendix had nothing to do with the peritonitis. (i. 1874.)

FOR Supposed ovarian tumour.

An unmarried woman, aged 44, was admitted on account of pain and abdominal swelling. The latter had been noticed for a fortnight only, but she had had pelvic pain for about two years. Examination showed a large hard mass filling up most of the pelvis (a fibroid), and a large elastic, slightly tender mesial abdominal tumour, extending upwards to a point midway between the umbilicus and sternum. The cervix was high up against the middle of the symphysis. The diagnosis was inflamed ovarian cyst. When the abdomen was opened, the abdominal tumour was found to be a greatly distended bladder pushed up by an interstitial uterine fibroid. Forty-four ounces of urine were drawn off by a catheter, and the wound was simply closed up again. The patient gradually became weaker and weaker, passed very little urine, and eventually died nineteen days after the operation, the wound having run a normal aseptic course, and the temperature remaining normal until the day before death. The post-mortem showed no peritonitis nor any definite cause for death, except a slight degree of chronic interstitial nephritis. The fibroid was about as large as a cricket ball. (Martha 14.)



SUB-TABLE, SHOWING THE NUMBER OF CASES OF ERYSIPELAS, PYÆMIA, &c.,
IN THE SURGICAL WARDS.

DISEASES.	Under 5.		5—10.		10—20.		20—30.		30—40.		40—50.		50—60.		60—70.		70—80.		TOTAL.		Deaths.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
CUTANEOUS ERYSIPELAS—																						
Admissions	3	1	...	1	...	...	...	...	1	...	1	3	5	...	...
Occurring in Hospital	1	...
Occurring after operation
PHLEGMONOUS ERYSIPELAS AND CELLULITIS—																						
Admissions	5	1	2	1	1	...	2	...	1	...	...	18	2	...	...	...
Occurring in Hospital	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Occurring after operation
PYÆMIA AND SEPTICÆMIA—																						
Admissions	1	...	...	...	...	...	...	...	...	...	1	3	...
Occurring in Hospital	1	...
Occurring after operation
DELIRIUM TREMENS—																						
Admissions
Occurring in Hospital
Occurring after operation	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...

APPENDIX TO SUB-TABLE OF CASES OF ERYSIPELAS, PYÆMIA, &c.

ERYSIPELAS.—Cutaneous.

Admissions.

Of eight patients, none died.

Occurring in Hospital.

The only case was that of a man, aged 29, admitted for malignant disease of the lung and abdomen, who developed a mild attack of facial erysipelas and soon died, chiefly of the malignant disease. (iii. 3463.)

Occurring after Operation.

There were no cases during the year.

Phlegmonous.

Admissions.

Of twenty-five patients, none died.

Occurring in Hospital.

Two men, aged 30 and 60, admitted for wound of the hand and compound fracture of the pelvis, developed cellulitis of the arm and leg respectively, but made good recoveries.

Occurring after Operation.

There were no cases.

PYÆMIA AND SEPTICÆMIA.

Admissions.

One male and four female patients were admitted; of these, one male and three females died.

A man, aged 67, admitted with pyæmia following suppuration about the elbow, died six days later; there was no post-mortem. (v. 1130.)

A woman, aged 42, was admitted in a moribund condition, and died next day; she had septicæmia, a facial carbuncle and a gangrenous condition of the lower lip; all this had followed a scratch from a baby's toe six weeks before; the post-mortem showed double septic pleurisy. (ii. 1476.)

A female infant, aged 7 months, who had been ill for seven weeks, was admitted very ill with abscesses in various parts of the body, and evidently the subject of pyæmia ; she died six days later, and the post-mortem showed renal thrombosis, double pleurisy and pulmonary infarcts. (iv. 2479.)

Occurring in Hospital.

The case of a woman, aged 20, admitted for a compound fracture of the femur, and who died of septicæmia nine days later, has been described under amputation of the thigh. (v. 1866.)

DELIRIUM TREMENS.

Admissions.

There were no cases with actual symptoms of delirium tremens at the time of admission.

Occurring in Hospital.

Seven patients showed symptoms of the disease soon after admission. Five of them were admitted for fractures. All recovered.

Occurring after Operation.

Two men, aged 29 and 71, developed symptoms after an operation for the radical cure of femoral hernia and a herniotomy for strangulated inguinal hernia respectively. Both made good recoveries.



TABLE OF AMPUTATIONS, WITH THE PERCENTAGE OF DEATHS DURING THE TEN YEARS
from 1888 to 1897 inclusive.

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of		Average Percentage of Deaths.
																					Case.		
	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Deaths.		
PRIMARY—																							
Thigh ...	2	2	2	1	2	1	1	...	1	50	100	100*	50	12	5	
Knee-Joint	1	1	...	
Leg ...	2	1	1	2	3	2	...	...	...	...	50	...	...	...	...	...	...	...	...	15	1
Ankle-Joint	...	...	1	1	...	...	...	...	...	...	...	...	100	...	...	...	...	...	...	2	1
Shoulder-Joint	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arm ...	...	2	1	6	...	1	1	...	...	...	...	50	100	...	...	...	...	...	...	15	2
Forearm	4	1	...	...	2	3	...	2	1	2	...	...	...	...	50	33-33	...	...	...	15	2
SECONDARY—																							
Thigh ...	4	1	3	2	1	2	25	100	33-33	100	...	66-66	16	3	
Leg ...	1	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...
Arm ...	1	1	...	1	1	...	...	...	...	...	...	...	...	...	100	...	...	...	...	5	1
Forearm	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...
Shoulder-Joint	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
* Foot also amputated.																							

* Foot also amputated.

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.							Total Number of Cases.	Average Per- centage of Deaths.				
	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1888.	1889.	1890.	1891.	1892.	1893.	1894.			1895.	1897.		
FOR DISEASE—																							
Hip-Joint	1	...	...	...	...	1	2	...	1	7	13.33	7.69	...	...	14.2	10.	5.26	50.	...	7	2	28.57	
Thigh ...	15	13	7	13	14	10	19	15	21	2	...	...	...	...	...	100.	5.26	13.3	9.5	...	134	13	9.70
Knee-Joint	...	1	...	2	2	1	1	1	1	8	14.28	14.28	...	...	...	100.	...	...	100.	...	12	13	16.66
Leg ...	7	7	4	6	6	11	6	7	8	...	...	...	...	...	...	...	...	...	12.5	50.	70	6	8.05
Ankle-Joint	6	1	6	...	4	5	6	4	12	4	48	1	1	2.08
Through the Scapula	1	1
Shoulder-Joint	1	3	1	...	2	2	33.33	9	1	11.11	
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TO REGISTER OF POST-MORTEM EXAMINATIONS.

SURGICAL, 1897.

BY THE SURGICAL REGISTRAR.

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